



TRANSFORMING THE ENTERPRISE

A whole new category of cloud-based enterprise software - the **Augmented Reality Management Platform** - promises to revolutionize the productivity, effectiveness, accuracy and safety of enterprise workforces and their supply chains

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Transforming the Enterprise

HOW THE AUGMENTED REALITY MANAGEMENT PLATFORM PROMISES TO REVOLUTIONIZE WORK FOR BILLIONS OF INDUSTRIAL WORKERS

EXECUTIVE SUMMARY

Four powerful forces are at play in evolving the way in which large organizations – and particularly industrial enterprises – empower their workforces. Here’s how they impact businesses.

Velocity

It all starts with velocity. Velocity is first **driven by innovation** and ever-faster cycles of technological adoption. Innovations that once took decades to achieve broad adoption are now seeing that shortened to a few years or less. Alongside that **product development velocity** is a concurrent speed with which **products and services become obsolete**. From VCRs to fax machines to video rental stores, obsolescence is not only a fact of life for consumers, but also for all the companies that must be nimble enough to **shift and adjust their operations** to meet the changing demands and tastes of their customers. Velocity also requires a **skilled and well-trained workforce** to keep up with those changing demands in always-competitive business environments that often carry with them a “change or die” dynamic.

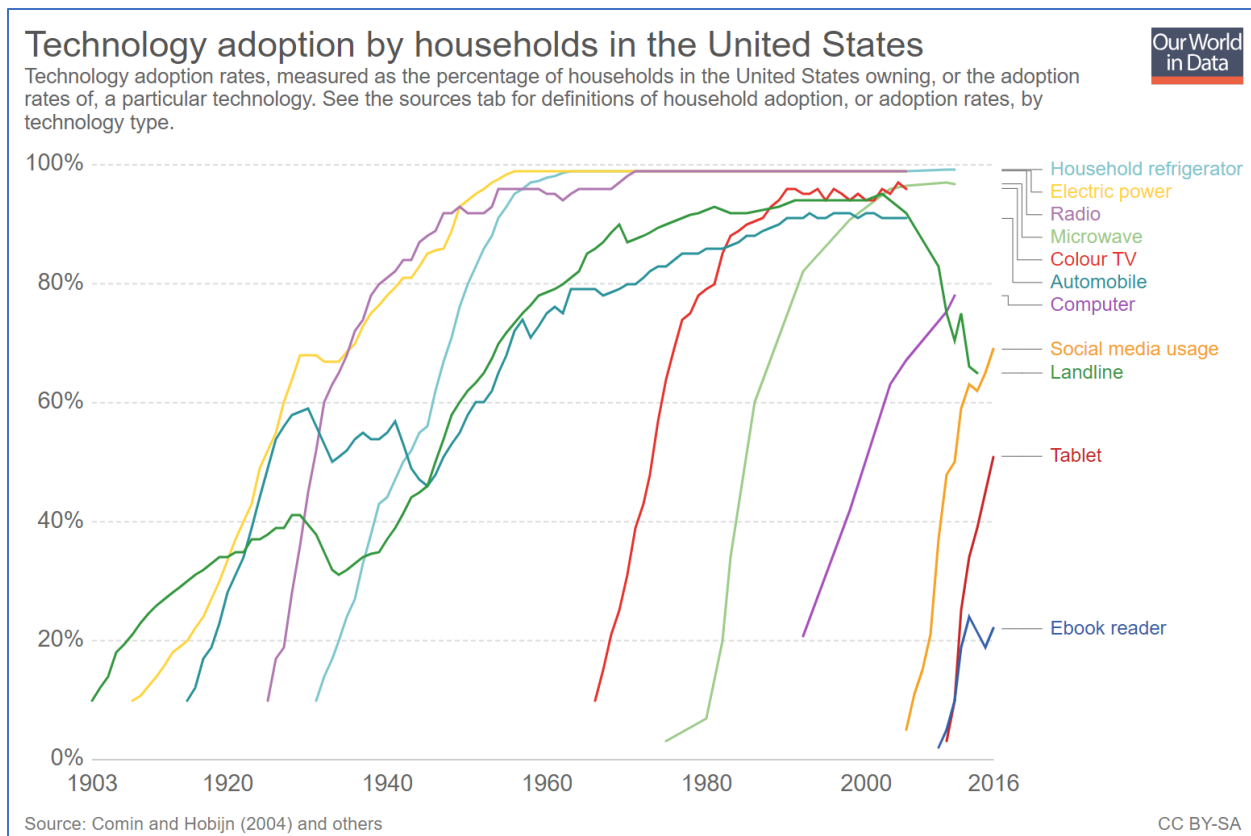


Chart from [Our World in Data](#) under Creative Commons license.

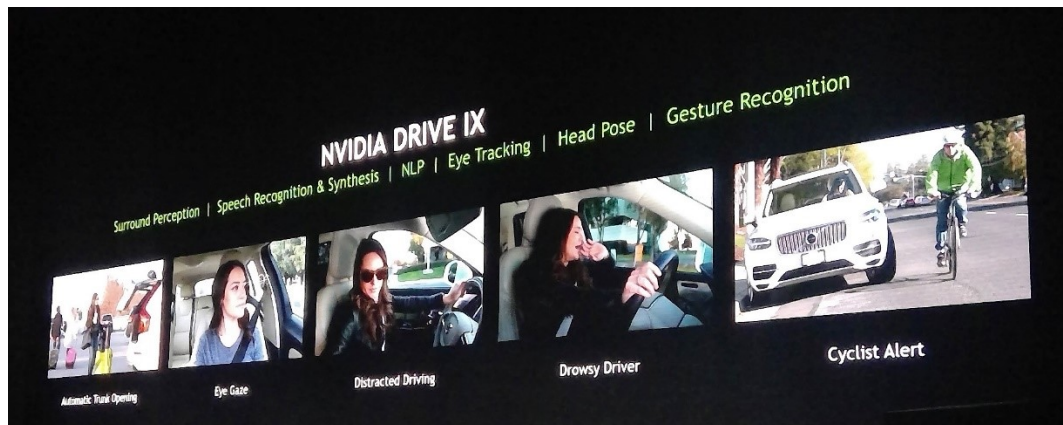
Connectivity

In order to meet these changing demands and needs of consumers, businesses around the world have become ever more connected. That connectivity flows throughout **every aspect of what a modern enterprise does** or produces. Smartphones, tablets, email, instant messaging, video collaboration systems, e-commerce sites and internal enterprise networks all facilitate communication within the enterprise and externally to suppliers and customers. Meanwhile, many large companies have used **traditional enterprise systems** to create connectivity across much of the data they generate and store – such as ERP, LMS, CRM, WMS and PLM. As organizations increasingly realized the value of this kind of connectivity – and the insights that could be gained from aggregating these systems – a major gap became clear. The gap lay in the lack of data about what was happening in the physical plant of industrial facilities – where a lot of data gathering and data entry was still done by hand while, at the same time, pockets of these facilities were starting to automate physical tasks with robotic devices. Enter **Industry 4.0 and the “smart factory”**, which brings together data from enterprise-connected IoT (Internet of Things) sensors with AI, machine learning, robotics and analytics to drive greater connectedness across enterprises and their increasing complex supply chains.

Businesses around the world have become ever more connected. That connectivity flows throughout every aspect of what a modern enterprise does or produces.

Complexity

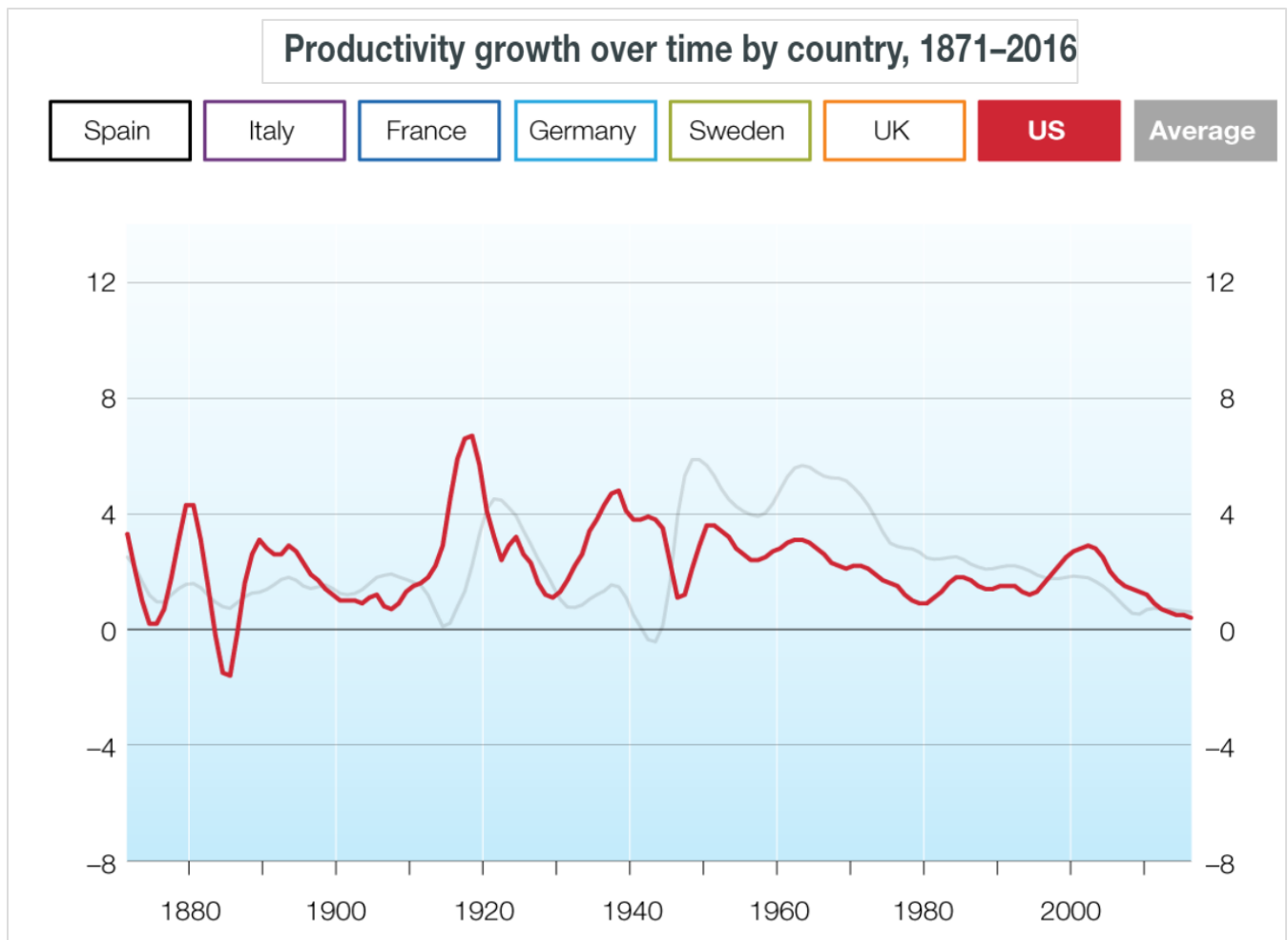
All of which brings us to complexity. Complexity comes from the fact that in order to thrive, an enterprise has to **be fast, nimble, well-informed**, competitive and optimized in everything it designs, produces, sells, delivers and supports. The complexity starts with **the products themselves** – which increasingly incorporate raw materials, components and parts from suppliers around the world, making growing use of software and services as a key differentiator and are in a retail environment where consumer expectations for quality, speed and accuracy of service are very high. A new high-end car, for example, not only often incorporates more complex (and often electric or hybrid) engine options, a range of digital services for drivers and their passengers and sometimes semi-autonomous driving options.



At the 2018 Consumer Electronics Show in Las Vegas, technology giant NVIDIA showed off the kinds of technologies finding their way into the modern car, all of which makes them both more powerful and complex.

Scarcity

And yet, while all these forces are at play on businesses, they must also deal with a fourth element: scarcity. Given the complexity of the products and services enterprises are building, selling and supporting, there is a **scarcity of well-trained people** to support them. And even in industries that have a history of having highly-skilled and experienced technical industrial workers, many of those workers are getting older and retiring as the “baby boomer” moves toward the end of workforce demographic timeline. There is also a **scarcity of time**, as many of the jobs that need to be most urgently accomplished (like getting a plane back in the air or a factory production line up and running again) became hugely more expensive when delayed. The pace of innovation and the very newness of the products and services enterprises are producing means that there is often a **scarcity of knowledge** on how best to provide everything from field service to operational support for them. And finally, there is a scarcity of productivity increases – as many of the enterprise systems introduced in the last 10 years have only provided incremental increases to productivity growth – which, according to data from McKinsey and Company (and many other sources) has been in decline for more than a decade.



From *Solving the Productivity Puzzle*, McKinsey and Company, February 2018.

The Pressure Point

These four key business forces all converge on a single point within the industrial enterprise: the industrial worker.



According to a [recent study by Emergent Capital](#), the majority of the world’s workforce (in industries such as construction, manufacturing and agriculture) are “deskless” workers who have been “forgotten and overlooked by technology providers”. Emergent Capital estimates that some **2.7 billion workers worldwide** fall into this category. It further reports that all of the industries which make up the category are looking to increase spending on technology to empower those workers, including drones, mobile devices, wearable devices (such as VR and AR headsets) and the enterprise software that makes those devices useful to workers.

Despite being 80% of the workforce, these (deskless) workers have been forgotten and overlooked by technology providers.

– Emergent Capital Survey, 2018

“Despite being 80% of the workforce, these workers have been forgotten and overlooked by technology providers,” Emergent Capital observed in its study. “Traditionally, little of the \$300 billion that is spent on business software each year has gone to these workers.”

AR Offers the Answer

As International Data Corporation (IDC) observed in June 2017, it is clear that the 2.7 billion workers worldwide whose lives have not been significantly improved by the introduction of technology in the workplace are on the cusp of seeing that situation change in a big way. Augmented Reality (AR) provides the answer to empowering that huge swath of the global workforce with a technology that will dramatically increase what they are able to accomplish at work – and improve the way they do so.

We believe that many industrial jobs will fundamentally change because of AR in the next 5 years.

– Ryan Reith, program vice president with International Data Corporation's Worldwide Quarterly Mobile Device Trackers in June 2017

Augmented Reality offers the promise of providing every member of the workforce with relevant, contextual, personalized information and guidance from across the enterprise into their field of view in a seamless, hands-free, intuitive manner that transforms the way they work.

With AR, industrial workers can use connected smartglasses, smartphones or tablet computers to gain access to the information and collaboration tools they need - at the time they need it. Providing this immediate and broadly-available access to key information from all inputs across the organization and its supply chain offers a significant way to tackle the issues raised by business velocity, complexity, connectivity and scarcity.

The Augmented Reality Management Platform (ARMP): A New Enterprise System for a New Business Environment

So Augmented Reality has a vital role to play in the realization of the Industry 4.0 vision of the connected, integrated enterprise – and in the empowerment of deskless workers with technology that brings together digital and real-world information in a way that helps them do their work more effectively.



To make this vision a reality, AR pioneer Atheer has defined a new category of enterprise software platform: the Augmented Reality Management Platform (ARMP). It is designed to provide the world's leading enterprises with a competitive edge by markedly improving the productivity, effectiveness, accuracy and safety of their workforces, customers, and supply chains.

In this White Paper, we'll explore the components of an Augmented Reality Management Platform, the pivotal role that it plays in tackling business complexity and the ways in which it can and will transform the work of enterprises and their supply chains.

The advent of the Augmented Reality Management Platform, as pioneered by Atheer, marks an important milestone for Augmented Reality in the enterprise. Aragon believes that the advent of the Augmented Reality Management Platform (ARMP) will truly transform how enterprises – and the supply chains that work with them – run their business and support their workforces.

– Jim Lundy, Founder and CEO of Aragon Research, October 9, 2018

We'll look at how AR addresses the three key business drivers facing any enterprise:

- Revenue growth - Allowing enterprises to scale and grow more effectively
- Operating cost reductions and productivity improvements – Providing the ability to do more with existing resources and put expertise where it will provide the most on-going impact
- Risk Management - Through improvements in the immediate delivery of detailed, contextual and specific content, collaboration services and the use of machine learning, artificial intelligence and predictive guidance, work can be carried out with greater accuracy, safety and timeliness (thus reducing risk)

The business imperatives behind all of these drivers are addressed by the broad applicability of AR technology in a vast number of use cases across enterprise operations.

Some examples of use cases where AR is making a difference include:

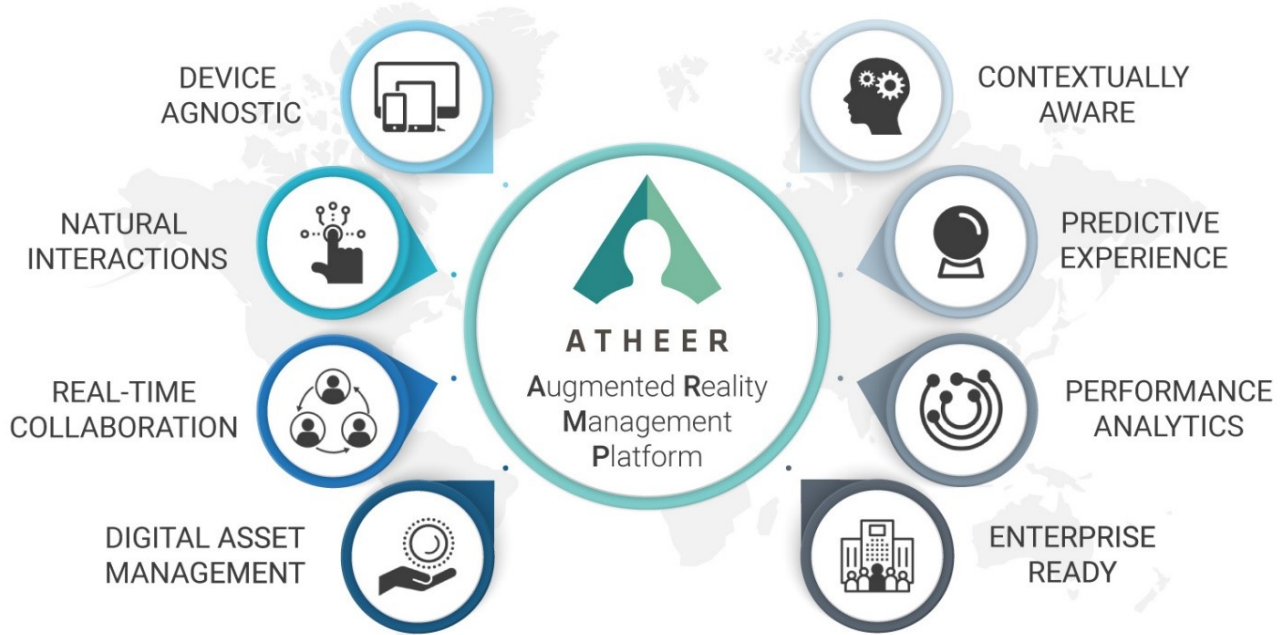
- Improving service resolution time in field service and dealer service scenarios.
- Reducing downtime on production lines,
- Getting planes back in the air faster and more safely by augmenting the people, partners and customers involved in aviation maintenance, repair and overhaul with contextual information and expertise.
- Reducing the Mean Time to Repair (MTR) of critical assets and infrastructure.
- Carrying out quality inspections more accurately and reducing the error rate on goods “picked and packed” in warehouses using AR technology.

All of these are clear use cases with tangible benefits that you can measure in real business terms. They also represent only a fraction of the broad range of potential AR use cases.

To support these use cases, Atheer has identified 8 key technology pillars as “must-have” components of any Augmented Reality Management Platform.

The 8 pillars of an Augmented Reality Management Platform

Each of the 8 pillars of an ARMP is designed to enable the success of AR across enterprises and their associated supply chains. It provides a “future-proof”, scalable cloud-based foundation that is flexible enough to take advantage of new AR hardware and form factors as they become available, while providing immediate ROI and value. The 8 pillars are shown below, followed by detailed descriptions about the role of each one.



Device Agnostic



Enterprises need to be able to use an AR Management Platform on the operating systems (including iOS, Android and Windows 10) and devices (including smart glasses, tablets, smartphones, wearables and laptops) that make sense for their business and their use case.

They need to be able to leverage existing investments in hardware, connectivity, device management and security – all with the knowledge that the value of their cloud-based AR Management Platform will continue to grow and evolve as they take advantage of new AR hardware and operating system enhancements.

Natural Interactions



It is important that front-line workers using an ARMP (the “deskless” workforce) are provided with tools that work unobtrusively and are natural to use, no matter what the use case.

In many industrial settings, workers need the ability to work with AR devices that offer hands-free operation (as they are using tools with their hands, wearing safety gloves or working in messy environments) – and that means support for smartglasses and alternative interaction technologies – such as voice commands, gestures and gaze.

Real-time Collaboration



Being able to instantly share and discuss an issue with a remote expert (or multiple remote experts from within the supply chain) in a “see what I see” video call supplemented by rich tools and content provides huge and immediate value to enterprises.

Digital Asset Management



A great ARMP needs to provide the ability to bring key digital assets into a worker’s field of view, including video, images, audio content, PDF documents, step-by-step work instructions, dynamic warehouse pick lists, checklists, linked workflows, and surveys.

Contextually Aware



An AR Management Platform must be context-aware. This awareness goes beyond the most simplistic information about time, location and user identity that most mobile applications provide today.

The ARMP needs to provide context in a deep and sophisticated way by making use of key data points to inform the experience and content offered to the worker. That data could include background on the skills and expertise of the worker performing the task, data about the equipment being worked on, information about the last time a given piece of equipment was serviced, as well as IoT data from sensors. The sensor data could provide even further insights, such as the temperature of the device or the room it sits in, the air quality of the environment or live “machine state” information. Contextual awareness drives an experience that truly augments the experience of a worker accomplishing a set of tasks.

Predictive Experience



All of the data about context, when combined with machine learning (ML) and artificial intelligence (AI), can yield profound predictive experiences for users of an ARMP.

AI and ML-powered analysis of historical data about work performed within an ARMP – alongside other contextual data could yield, for example, insights about when a given piece of equipment might fail, what business or work processes need to change or when conditions in a workplace may become unsafe. A predictive experience could also as simple as an assistance prompt for a user whose history shows they are continuously having problems with a particular section of a complex series of work instructions. By proactively offering that particular user the contextual guidance it is clear that they need – or a video call with a relevant expert – you can help that user be more productive.

Performance Analytics



An ARMP can offer vital business intelligence from the performance analytics data it provides, at every level of granularity (from the individual right to the entire supply chain).

The platform's dashboard should show how the collaborations tools available within are being used, which sets of work instructions and business processes are most effective and provide comparison trend between individuals, departments, locations, business divisions and even suppliers.

Enterprise Ready



An ARMP needs to offer the reliability, availability and security expected by enterprises, along with necessary integration capabilities (for integration with ERP systems, service clouds, WMS systems, PLM systems, content management systems, data repositories, active directories and other key enterprise resources and services). It also needs to provide the scalability and extensibility you would expect from an enterprise-grade platform.

The integration work needed to provide enterprise readiness should power contextual awareness, the predictive capabilities of the ARMP (as it is able to draw data and insights from across an organization's enterprise applications) as well as performance analytics and ROI reporting.

The 8 pillars of an AR Management Platform are designed to enable the success of AR across enterprises and their associated supply chains. It provides a “future-proof”, scalable cloud-based foundation flexible enough to take advantage of new AR hardware and form factors as they become available, while providing immediate ROI and value.

What Do Enterprises Need to be Effective with AR?

In defining the principles of an Augmented Reality Management Platform, Atheer has learned a great deal about the needs of industrial enterprises – and how to make Augmented Reality effective for them. Here's a few things we have seen in our worked with customers.



A Messy Place

The real world is messy and that any AR Management Platform has to take that into account. It cannot rely on a tidy environment with a single set of hardware or communications technologies underpinning it. It needs to be flexible, customer-focused and ever-evolving based on customer needs.

Any Additional Complexity is Unwelcome

Industrial workers have a low tolerance for complexity. On a factory or shop floor, half-baked solutions don't last long. Any technology-based addition to the workload of industrial workers will only gain acceptance and traction if it is genuinely easy to use. In general, you don't get points for just being cool.

Return on Investment Must Be Measured

Real ROI has to be measured and demonstrated for an ARMP to achieve broad deployment. It is fairly common for a line of business within an enterprise to conduct a small pilot without the need to show significant ROI, but to get the buy-in necessary for both the IT department and senior management to champion an AR Management Platform deployment at scale, it **MUST** show significant ROI.

Data changes everything

You need to be able to measure the effectiveness of any technology you propose bringing to an enterprise. AR is uniquely positioned to bring together data collection with innovative use cases where clear ROI can be demonstrated. In addition, the act of collecting the data itself and bringing it together within an ARMP can create huge new value and insight for the enterprise as it gains a perspective on the operations of the business that it has not previous had.

We believe that the advent of the Augmented Reality Management Platform will truly transform how enterprises – and the supply chains that work with them – run their business and support their workforces. And we look forward to exploring that in detail with you throughout the rest of this White Paper.

Evolution of the Enterprise Information System

There has never been a time when the challenge and opportunities represented by the forces of business velocity, connectivity, complexity and scarcity were as great as they are now. These forces are driven by everything from a need to run “greener” operations that have less of an impact on the environment to the introduction of new technologies, a swiftly evolving regulatory environment and uncertainty in the future of key trade agreements.

These are challenges facing every industry, from aviation to the automotive sector – and from manufacturing to transportation and logistics. Aerospace companies build and service ever more complex aircraft that are, in many ways, as dependent on the software that controls their operations as they are on the engines, landing gear and cockpit instrumentation.

The manufacturing process of aircraft manufacturer Boeing’s 787 Dreamliner offers an excellent illustration of both the complexity and international nature of modern manufacturer. It is manufactured with components from 287 suppliers across no less than 22 countries.

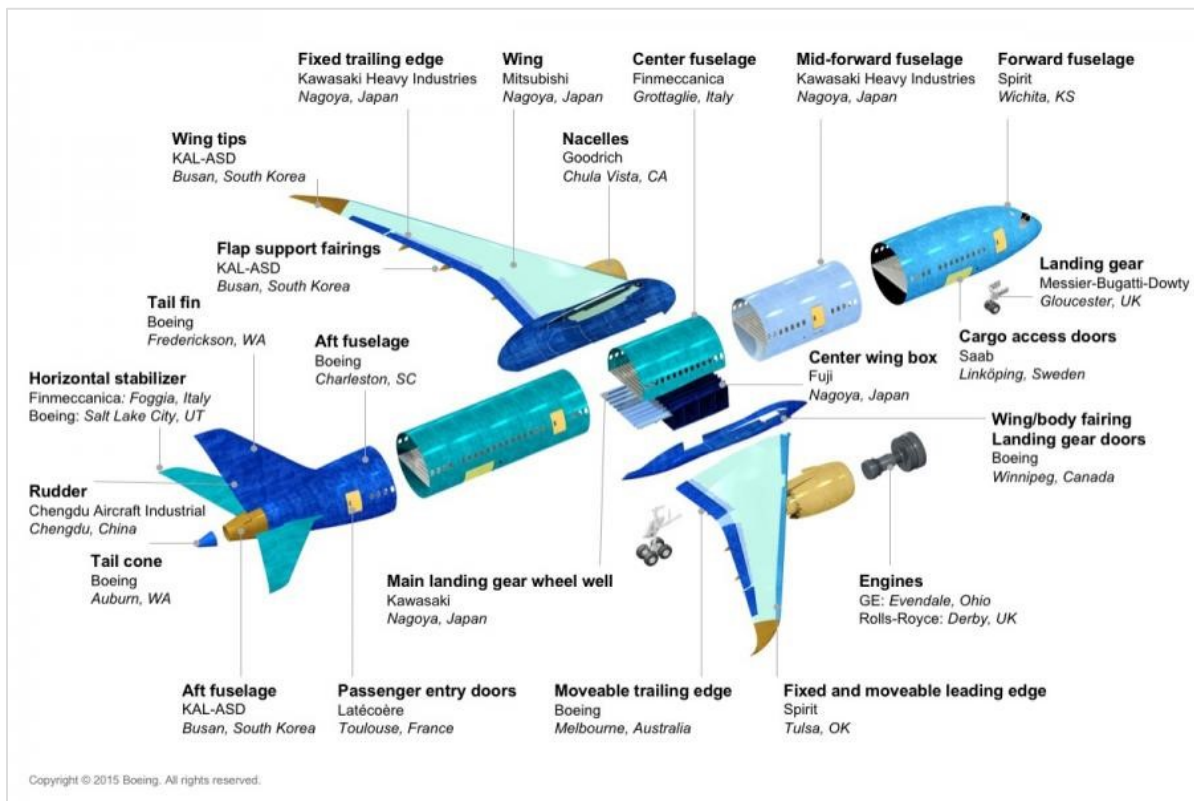


Diagram from *the U.S. Chamber of Commerce*.

In fact, the Boeing Dreamliner is such a great model of modern, complex international and interdependent manufacturing that it was offered in 2016 as an example of global supply chain complexity by the U.S. Chamber of Commerce. The major takeaway from this example is that modern manufacturing is a highly interdependent, complex (and often international) undertaking. Manufacturers are vulnerable to any single point of failure along the global supply chain.

All of the pieces shown in the diagram have to come together in order to build a new Dreamliner. You can't deliver a plane that is missing the landing gear doors or the aft fuselage. Any delays due to issues with any of the components shown above have significant implications for both manufacturers and their customers.

Automobile manufacturers also face this kind of complexity. They build new cars that are increasingly connected, use electric drive trains and will soon be able to run in semi-autonomous and autonomous modes. They also work with an evolving range of new suppliers, as automotive manufacturer supply chains now include a greater representation of software and electronics manufacturers to power the new features of these more complex cars.

There Have Been No Shortage of Solutions

Over the last three decades, a broad range of enterprise technologies have emerged to meet the process and communications challenges and opportunities created by increased business velocity, connectivity, complexity and scarcity, including:

- Material Requirements Planning (MRP)
- Customer Relationship Management (CRM)
- Product Lifecycle Management (PLM)
- Manufacturing Execution Systems (MES)
- Warehouse Management Systems (WMS)
- Enterprise Resource Planning (ERP)

Most of these enterprise software solutions trace their roots back to the MRP (Material Requirements Planning - pioneered by Black & Decker in 1964) and MRP II (Manufacturing Resource Planning) systems of the 1960s and 1970s.

These early MRP systems were followed in the early 1980s by the introduction of "supply chain management" solutions (the ideas for which were pioneered by leading consultants such as Booz Allen Hamilton's Keith Oliver). The real software magic for the supply chain world, however, started in the 1990s when the first Enterprise Resource Planning (ERP) systems appeared.

The concept was simple and straightforward – and involved connecting suppliers with customers through a number of interlocking applications.

MRP and ERP weren't the only three-letter acronyms that were thrown at the challenge of connecting business internally – and their supply chains externally. Customer Relationship Management (CRM), PLM (Product Lifecycle Management), WMS (Warehouse Management Systems) and MES (Manufacturing Execution Systems) all aimed to provide components of technology solutions needed to tackle the issue.

Integration Has Been a Key Driver, But It is Not Universal

Several key moments of consolidation and integration provided ways for each of those solutions to provide benefit. Many of them came together as “modules” within an integrated ERP system that eventually covered everything from procurement to production, distribution, accounting, human resources, customer relationships and sales.

These enterprise software solutions often did a great job of pulling together a lot of the data about the operations of the enterprise and providing an integrated view of that data from which to draw insights about the operations of every aspect of the enterprise. In general, however, what they did not do was provide a connection between the physical operations of the business and the data generated by the business.

While a CRM system, for example, might be used an organization’s sales and marketing team to track, nurture and follow-up with sales leads throughout a sales cycle, the solution used to help employees get goods to those customers might be considerably more basic.



Even with a CRM in place, warehouse operations may primarily still be based on employees using clipboards with print-outs of customer orders and handheld barcode scanners to keep track of what employees are adding to a given order. In an ideal world, you would want integration between CRM and WMS, but that might not always happen.

Meanwhile, without a connection between physical operations and the digital information used in a business, maintenance and field service crews often communicate by radio and mobile phone to carry out service work. As a result, little – if any – of the valuable knowledge generated in those calls was captured digitally to re-use in a strategic way.



Enterprises in a field service scenario need an easy way to scale the knowledge articulated and delivered by an organization’s experts. When those experts are helping crews in the field, the insights they provide should ideally scale beyond the work they do to help that crew. Ideally, there should be a way to make those insights available to the broader field service teams or maintenance crews across the company.

This disconnect between way in which centralized ERP operations helped to smooth the operations of the many parts of an enterprise that had embraced digital technologies, but did little for those parts of the business that had not, led to a search for new solutions.

Enter Industry 4.0

Despite the great success of ERP, many industrial visionaries realized that it didn’t go far enough. While stitching together all the elements of an ERP system provided a great deal of value, it didn’t really cover the whole of a company’s business operations. The value provided by ERP systems was only as good as the data held within it – and the parts of the business it touched.

Transforming the Enterprise

One of the organizations to articulate a way of moving beyond ERP was the German government's [Trade & Invest](#), which in 2011 became a champion of what it called Industry 4.0 (or "the smart factory") as part of an initiative to modernize German manufacturing.

It has since become a popular way to think more broadly about the future development of manufacturing – and been adopted by governments, private companies and multi-national organizations (such as the OECD, whose own conception of Industry 4.0 is shown below).

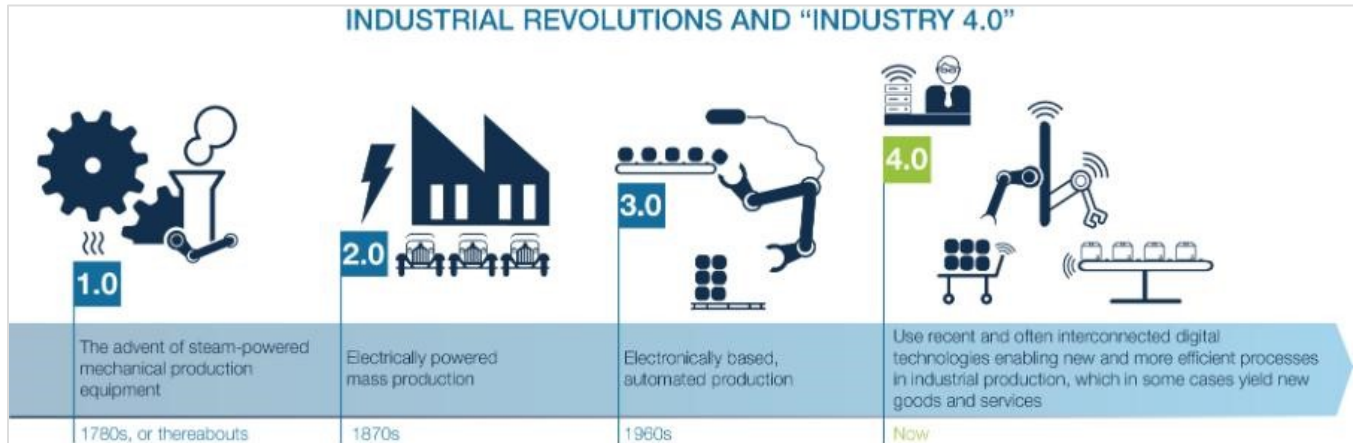


Diagram from [the Organisation for Economic Co-operation and Development \(OECD\)](#)

The notion behind Industry 4.0 is that it brings together the physical assets of the modern factory with the cyber assets (alongside a number of new technologies) to create "smart factories" that leverage insights gained from Big Data, Artificial Intelligence, Machine Learning and Internet of Things (IoT) devices to work more safely, accurately and effectively. Other key Industry 4.0 technologies include:

- Enhanced robotics and automation
- Cloud-based services
- Predictive maintenance solutions informed by AI and machine learning
- Custom 3D-printing-based manufacturing
- Augmented Reality

Don't think from the list above that realizing the Industry 4.0 vision is primarily about implementing technology - far from it. In fact, it's mostly about enhancing the power of the broad industrial workforce and providing the access to key enterprise resources for the massive "deskless" workforce at the front lines of industrial work. Technology happens to be a great enabler of that goal – and Augmented Reality, in particular, stands to bring huge benefit to enterprises, their workforces and their supply chains.

The Future Will Bring Together AR, Cloud, Mobile, AI and Edge Computing

The transformative technology of augmented reality will harness of the power of other key technologies (including cloud computing, mobile computing, artificial intelligence and mobile computing) to deliver a true revolution in the way enterprises work.

AR is Key

Augmented Reality will be the center of the experience for the deskless workforce. Regardless of the devices employees are using (whether they are tablets, smartglasses, smartphones or some other new wearable form factor that provides voice recognition, 3-D or 2-D visual content, touch, other forms of manual control and camera input), the experience will begin and end with the blended physical and digital environment in which they do their work.

This work may take place across multiple devices, but it will be conducted with a consistent experience and access across devices to the same set of data, networks and the means to securely collaborate digitally with colleagues within the organization (and across the supply chain). For many organizations, it will start with smartphones and tablets – a “mobile first” approach that allows enterprises to make the most of existing IT investments to begin working with AR.

Cloud Technology Provides the Foundation

Cloud technology provides a foundation for this kind of workforce empowerment, ensuring that enterprises and their supply chains are working with the same digital experience, work instruction creation and delivery mechanisms, “remote expert” and group collaboration functions and have mutual access to relevant shared data.

Mobile Devices Will Change

Mobile devices will be the physical delivery systems of this empowerment, providing ever more powerful computing power at the edge of the network to tackle complex tasks and deliver the richest possible experiences to users of these devices.

These devices will be fast, tightly connected to fast 5G and WiFi networks and evolve rapidly, with the wearable headset of 2028 bearing as much resemblance to the smartglasses of today as the modern smartphone does to the carphone of the 1980s.

Market-foresight advisory firm ABI Research forecasts that almost 10% of industrial smartglasses and standalone Virtual Reality (VR) devices will have a 5G connection by 2026.

AI Drives Value

Artificial Intelligence will drive the real value of these implementations. Using machine learning to provide the data to drive AI-powered analysis of work conducted on an AR platform - combined with other inputs from the digital factory (such as IoT devices) - AI will yield true insights on everything from business process optimization to predictive maintenance scheduling to productivity improvement strategies.

The Network is Still the Computer

To fully realize the promise of all of the above technologies, there will be a requirement for greater network capacity and processing power than is often available to today’s cloud applications running on existing WiFi, 3G or 4G wireless networks and mobile devices. Daniel Newman, principal analyst at Futurum Research explains this need in [a detailed report on Marketwatch.com](#).

In the report, he says that data is being “created faster than it can be managed, so artificial intelligence, smart cars, manufacturing plants, cities and other ‘smart’ objects, networks and systems will require Edge Computing to process, store, and analyze it”.

He observed that the alternative — which would involve pushing every bit of data to the cloud for processing, analysis and storage, then waiting for packets of information, policy and commands to come back to the device or network — is both untenable and inefficient. “By performing these functions on the edge, devices, networks and systems can react in real time to critical needs and can operate reliably even when their connection to Cloud services become compromised,” he explained.

AR Will Keep You on the Edge

Solid, secure, reliable and fast mobile enterprise AR applications enabled by “edge computing” (on whatever devices make sense for the work in question) - will be the key to empowering all workforces and providing the foundation for safe, compliant work across the extended enterprise.

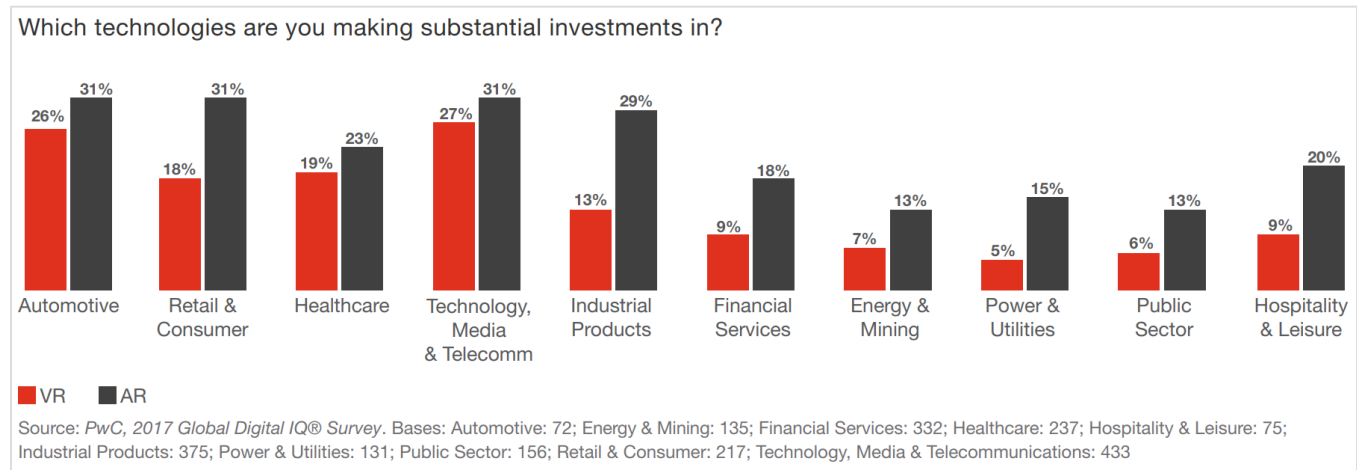


According to Philbert Shih, Managing Director at Structure Research and co-author of [a recent report on the importance of edge computing](#), there are a broad range of technological and business imperatives driving adoption of edge computing.

As the industry shifts towards IoT, self-driving vehicles, augmented reality, smart cities and numerous real-time applications, we see high-performance compute, storage and network resources rapidly moving as close to the end user and devices as possible—to the edge of the last mile network,” he predicted.

The Empowered Enterprise

A good overview of how all these technologies can support the empowered enterprise came in a [“Essential 8 Technologies” report in November 2017](#) from consulting giant PwC. It observed that many manufacturers have started to bring smartglasses with Augmented Reality software into their factories and plants. The chart below shows the report’s observations on where different industries are investing in Augmented Reality (AR) and Virtual Reality (VR).



“These wearable computers provide information tailored to the worker’s context and space. By just looking at a shelf, a worker can see data through the glasses about what is stored there,” PwC explained in the report. “Smartglasses can also help when it comes to assembly instructions or equipment repair. They show step-by-step instructions in the wearer’s field of view, freeing up the worker’s hands to actually assemble or repair the goods.”

PwC estimates that more than 14 million workers will wear smartglasses by 2025, up from 400,000 in 2016.

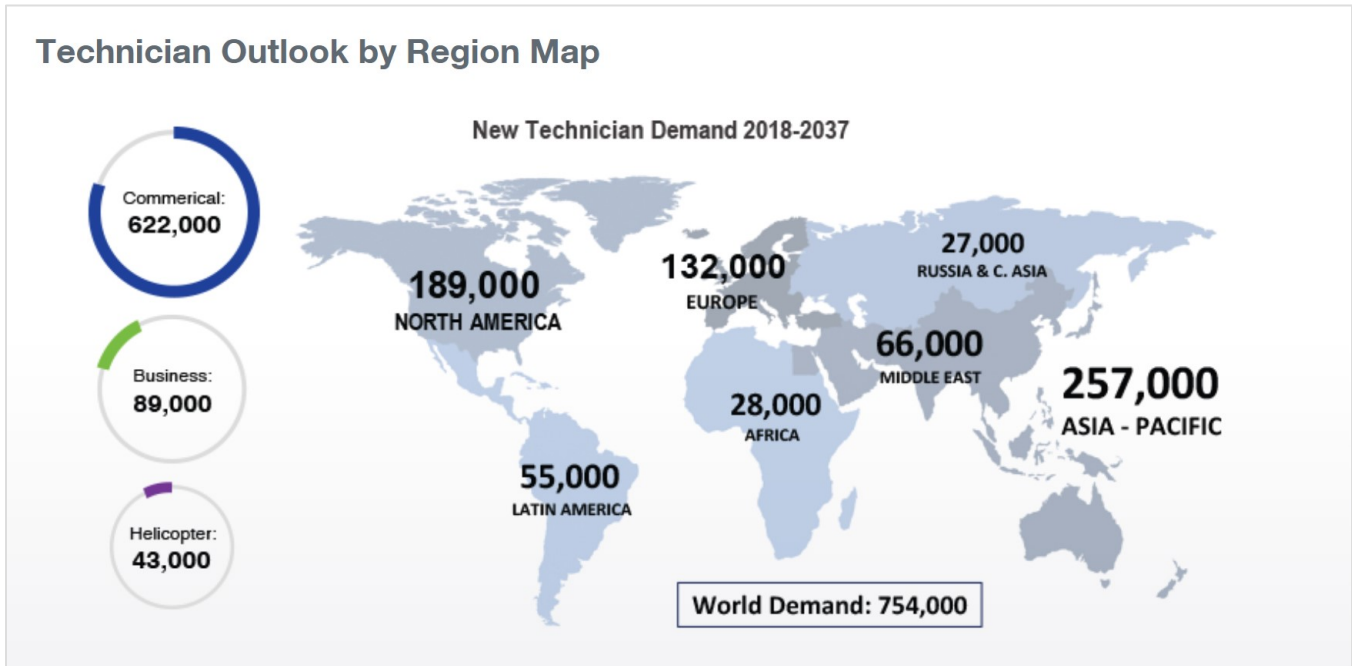
Why Enterprises Will Join the AR Revolution at the Edge

Stepping back from the technology issues for a minute, it’s worth exploring the real-world business problems facing many enterprises today, to shed light on why they are looking to work differently.

- Shifting workforce demographics
- A shortage of skilled labor and a falling unemployment rate
- Choosing the right technologies at the right moment to make a difference to the business

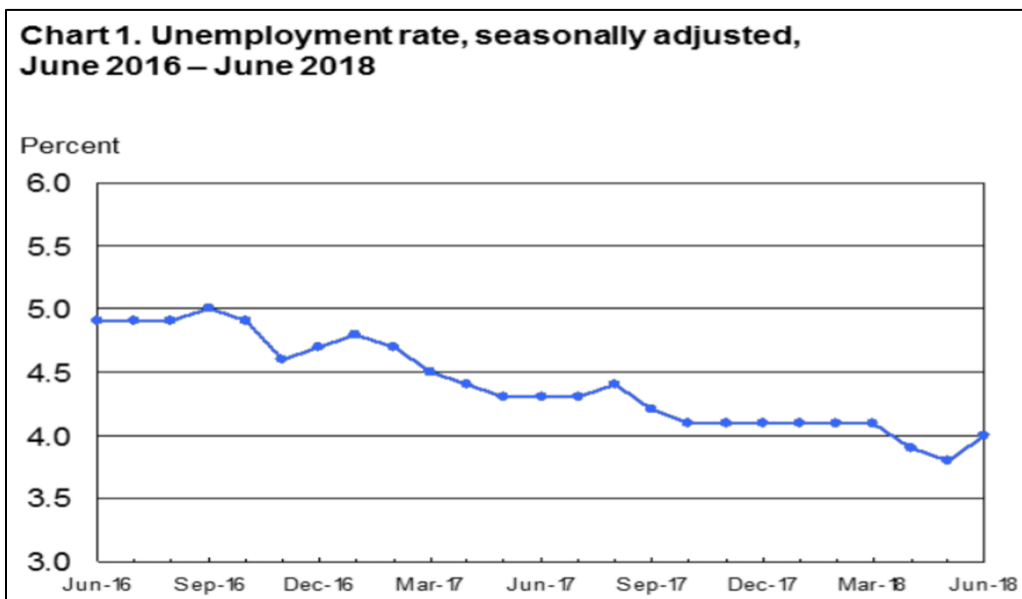
Starting with workforce demographic changes, it’s no secret that at the population bulge of the post-World War II “baby boom” (often defined as those born between 1946 and 1964) ages, the ratio of older workers is growing – with many either retired or nearing retirement age.

Meanwhile, we are also seeing a shortage of skilled labor in a number of key industries. One great example of this comes from the aviation sector. According to the [2018 Boeing Pilot & Technician Outlook](#) – this skill shortage represents a major challenge to the maintenance and growth of aircraft fleets worldwide. The report predicts that some 754,000 new maintenance technicians will be needed to handle the maintenance, repair and operations work on aircraft over the next 20 years.



Data and map from the [2018 Boeing Pilot & Technician Outlook](#)

Against this background, we have been seeing another large trend over the last couple of years – declining unemployment in the United States.

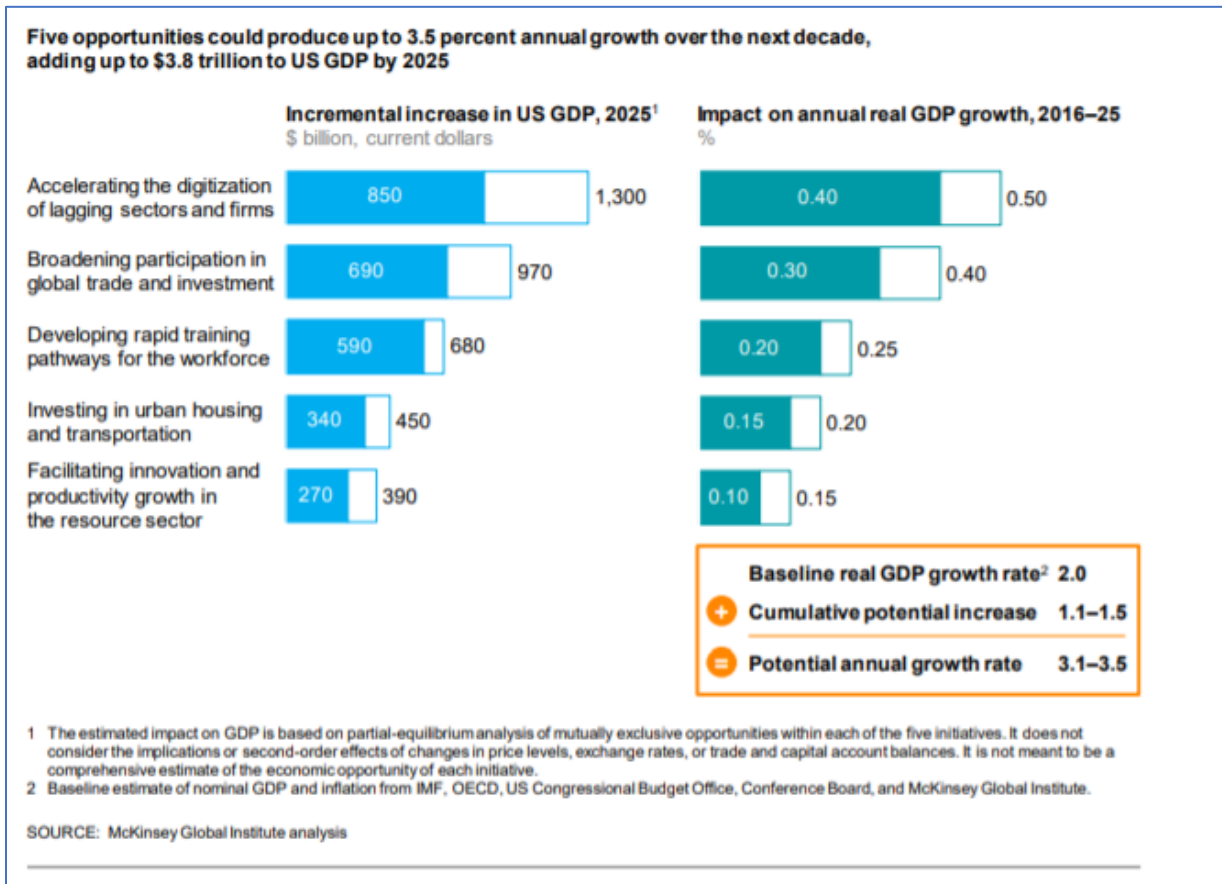


Data from the U.S. Bureau of Labor Statistics

The lower unemployment rate has created an interesting dynamic where older, skilled and experienced workers are staying in the workforce longer and are doing so in an environment where they are in high demand (both in terms of the immediate benefit their skills can provide and the knowledge transfer they can provide).

Finally, businesses are awash with opportunities to invest in technologies that promise to re-invent the ways they do business. A [recent analysis by the McKinsey Global Institute](#) offered a guide to where enterprises may be choosing to make their most impactful investments between now and 2025 – and the anticipated GDP growth expected to result from it.

Note that two of the top three opportunities lay in technology investments: “accelerating the digitization of lagging sectors and firms” as well as “developing rapid training pathways for the workforce”.



Source: From the [McKinsey Global Institute, December 2017 report](#)

So how will all of these large, real-world business issues be impacted by the delivery of Augmented Reality to the edge of the network? Interestingly enough, they will be impacted both directly and positively.

In the case of the aging (and longer-working) baby boomer part of the workforce, Augmented Reality will allow them to become “remote experts” who can help troubleshoot real-world issues quickly and efficiently by being able to connect directly and instantly (through AR “see what I see” video calls) with colleagues anywhere in the world. AR will enrich the contributions that this skilled workforce can offer, while enhancing the ability for knowledge transfer to younger employees.

Even with a dropping unemployment rate and a tough hiring environment, AR will also be able to help meet the demands of business for skilled workers by allowing less-skilled workers to be productive more quickly and get the guidance and on-the-job training they need to become more useful more quickly.



And finally, AR will prove to be one of the easiest technologies for which to provide return on investment (ROI), as the measurable improvements in productivity, accuracy, safety and collaboration will make it a highly attractive place to begin digital investments (and integrate with other technologies such as IoT, edge computing and AI).

The AR Management Platform: A New Enterprise Software Category

While Augmented Reality holds tremendous promise and opportunities for significant ROI, implementations of AR enterprise software have not always delivered on this promise.

Many have been one-off “point” solutions designed around a limited set of features and use cases, as well as a modest range of hardware (primarily Android-based smartglasses and some Android tablets and smartphones).

These solutions would typically offer users of AR hardware some form of “see what I see” video calling, as well as delivery of work instructions and the ability to take and use photos, record video and audio and display images, Word documents and PDFs.

While these functions are all useful additions to the working life of someone wearing smartglasses, they haven’t so far allowed enterprise AR to be the kind of really capable, integrated system that you would expect to complement the kinds of ERP, WMS and CRM systems that enterprises are used to relying upon.

Delivering the Power of AR

As a result, Atheer Inc. has announced a whole new category of cloud-based enterprise software – the Augmented Reality Management Platform (ARMP) – which promises to deliver the power of AR to improve the productivity, effectiveness, accuracy and safety of enterprise workforces, customers, and supply chains.

An ARMP also brings together - on smartglasses, smartphones or tablets – the potential to use not only all the information generated by major Industry 4.0 technologies for the enterprise workforce and its supply chain, but also data from previous generation of enterprise software applications (including WMS, ERP and PLM).

So what is an ARMP? It is:

- A mobile-first, cross-platform, cloud-based enterprise AR platform that leverages the power of ARCore, ARKit and Windows mobile devices (including smartglasses, smartphones and tablets)
- A natural evolution of - and a point of integration with - traditional enterprise systems, including ERP, LMS, CRM, WMS and PLM.
- Composed of eight pillars (it must be device-agnostic, support natural interactions, offer real-time ‘see what I see’ video, audio and text-based collaboration, digital asset management, contextual awareness, a predictive experience, performance analytics and be enterprise-ready)

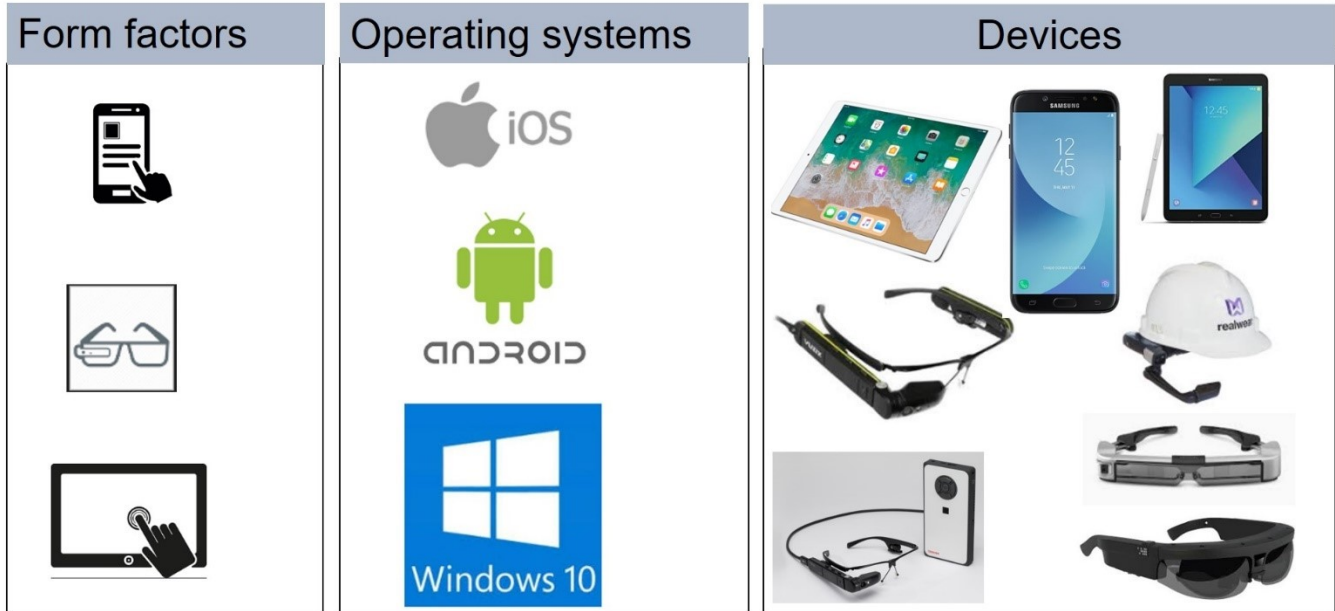
The 8 pillars of an AR Management Platform are designed to enable the success of AR across enterprises and their associated supply chains.

The 8 Pillars of an AR Management Platform

Here’s a detailed description of the eight pillars of an ARMP and how they deliver value for industrial enterprises by offering:

A device-agnostic approach

As suggested in the Executive Summary, enterprises need to be able to use an ARMP on the operating systems (including iOS, Android and Windows 10) and device form factors (including smartglasses, tablets, smartphones, wearables and laptops) that make sense for their business and their use case.



They need to be able to leverage existing investments in hardware, connectivity, device management and security – all with the knowledge that the value of their cloud-based ARMP will continue to grow and evolve as they take advantage of new AR hardware and operating system enhancements.

It is essential that an ARMP be developed with a “mobile first” philosophy that stresses the vital need to offer a great experience for users on smartphones and tablets, while also taking full advantage of the additional capabilities that smartglasses provide.

Natural Interactions

Workers need to be able to use an ARMP regardless of their use case, so it must support the broadest possible set of interaction options. In many industrial settings, workers need the ability to work with AR devices (such as smartglasses) that offer hands-free operation (particularly if they are using tools with their hands, wearing safety gloves or working in messy environments).

In such cases, they may want to use voice control, hand gestures or gaze to control their AR devices. There will also still be many situations where traditional touch controls (as provided on typical smartphones or tablets) are adequate to the task.

Real-time Collaboration

From training to troubleshooting, being able to collaborate in real-time using “see-what-I-see” functionality, group calling and shared content can dramatically cut down the time required to meet a given business challenge.

Being able to instantly share and discuss an issue with a remote expert (or multiple remote experts from within the supply chain) provides huge and immediate value to enterprises.

Digital Asset Management

A great ARMP needs to provide the ability to bring key digital assets, including video, images, audio content, PDF documents, step-by-step work instructions, dynamic warehouse pick lists, checklists, linked workflows, and surveys.

Contextual Awareness

Whether used on mobile phones, tablets or smartglasses, all ARMP implementations operate on mobile devices, which provide a great deal “out of the box” contextual information, including where the device is, who is signed into it and what the time and date is.

When you add an ARMP into the mix, you now also have access to contextual data about what the user is doing, what challenges a given user may be facing with which tasks at which times, whom they are connecting with to troubleshoot any issues they may encounter with their work – as well as whatever intelligence may be gleaned from IoT or sensor data (such as temperature, air quality or machine state information).

Predictive Experience

All of the data about context, when combined with machine learning and artificial intelligence, can yield profound predictive experiences for users of an ARMP. Those experiences may be as simple as an assistance prompt for a user whose history shows they are continuously having problems with a particular section of a complex series of work instructions.

By proactively offering that particular user the contextual guidance it is clear they need – or a video call with a relevant expert – you can help that user be more productive.

Performance Analytics

There are many circumstances under which users of an ARMP will be able to gain vital business intelligence from the performance analytics data it provides, at every level of granularity.

At the individual user level, it is possible to see how well a given set of work instructions is helping that user – and where the work instructions might need tweaking to be more effective. That same analysis could be carried out for a team, a department – or even the whole enterprise.

Enterprise Readiness

To be effective, an ARMP needs to offer the reliability, availability and security expected by enterprises, along with necessary integration capabilities (with ERP systems, service clouds, WMS systems, PLM systems, content management systems, data repositories, active directories), as well as scalability and extensibility.

The Business Value of an AR Management Platform

There are three essential business goals that an ARMP must support:

- Driving growth and revenue
- Reducing costs and improving productivity
- Managing (and reducing) risk

An ARMP offers support each of these goals in a unique way, combining the rich history and capabilities of enterprise management solutions to create value across use cases and business needs. Here are just a few examples of how that promise can be delivered for each of these goals.

Driving Growth and Revenue

A useful example is the United States trucking industry. In August of 2018, the [American Trucking Association \(ATA\) reported](#) that in 2017 trucks in the United States moved 10.77 billion tons of freight (70.2% of all domestic freight tonnage) and generated \$700.1 billion in annual revenue in 2017. [Transport Topics](#) reported that this represented a 3.5% increase compared with the previous year (when the industry generated \$676.2 billion).



Trucking is an industry facing heavy demand – and it needs help driving growth and revenue. That is especially true in trucking maintenance, where the increased demand for capacity facing the industry means that it must look for innovative solutions to maintaining its fleet faster and more effectively, without compromising safety.

According to Duke Drinkard, past chairman of the Technology and Maintenance Council (a leading industry body for the trucking maintenance industry), delays in maintenance can place real limits on industry growth and significantly impact revenue.

“Many fleets, including owner operators, do not have the skills needed to diagnose and/or repair their trucks, requiring use of an authorized dealer,” he explains. “And, so their vehicles sit in line, waiting for a qualified technician and shop space to have their trucks repaired. The impact is potential lost revenue, potential loss of customer and potential loss of drivers.”

None of those losses are acceptable to a fast-growing industry. So Bill Brown, chairman of the Technology & Maintenance Council’s Future Truck Committee, says trucking maintenance organizations are looking at Augmented Reality to address the issue. “Probably the highest-ranked near-future benefit (of Augmented Reality used in trucking maintenance) would be the ‘see-what-I-see’ capability,” he said. “The technician wears a (hands-free) headset and microphone and the expert guides, remotely.”

Reducing costs and improving productivity

To understand how an ARMP can make a huge difference in reducing costs and improving productivity, you need look no further than Ather customer Porsche Cars North America (PCNA), which adopted an AR-based platform using Ather technology in November of 2017.

By May of 2018, the company announced that it would start rolling out “Tech Live Look” (Porsche Cars North America’s name for its AR initiative) to its 189 dealers in the United States. In the announcement, the company explained the system connects dealership service technicians to remote experts via smartglasses for a live interaction that can “shorten service resolution times by up to 40 percent”.



The full story is actually best heard from PCNA directly, which said in its May 2018 announcement the following:

Tech Live Look combines computerized eyewear and augmented reality software to allow remote experts hundreds of miles away to see what a service technician is seeing and provide feedback while the technician works hands-free. The system uses industry-leading components: ODG (Osterhout Design Group) R-7 smartglasses and the AiR Enterprise software platform from Atheer, Inc.

“Tech Live Look is the kind of digital innovation Porsche values because it raises the quality of the customer experience,” said Klaus Zellmer, President and CEO of PCNA. “By solving issues faster, our dealer partners can get their customers back into cars with less disruption. And our overall service quality increases as we share expertise more efficiently between our experts and dealer technicians.”

How does the technology work? Until now, a complex or unusual technical issue could go back and forth repeatedly between a dealership and the PCNA technical support team. It could take multiple electronic messages, phone calls, photos, and even on-site visits by Porsche’s Field Technical Managers to identify and diagnose the issue for repair.

Tech Live Look substantially shortens and enhances that chain of communication. A service technician at a dealership, for example in Los Angeles, dons the smartglasses and connects through the software with the Atlanta-based Porsche technical support team 2,200 miles away. Via high-definition live video from the glasses, the support team sees exactly what the technician is seeing. The expert in turn can project step-by-step technical bulletins and schematic drawings onto the display inside the technician’s glasses, as well as take screen shots and enlarge images for better visibility. The technician can open and view documents while working hands-free on the car. This information exchange is far more efficient than sending electronic forms and photos or explaining complex technical issues over the phone.

It’s not hard to see how this application of some of the key features within an ARMP helped Porsche Cars North America to reduce costs and improve productivity. And remember, the benefits quoted by PCNA are being achieved by an extremely well-trained workforce that already delivered some of the most highly-rated customer service in the automotive industry. Porsche’s commitment in this area is demonstrated by its recent win in the luxury category of [the inaugural J.D. Power Overall Ownership Experience Award](#).

Managing and Reducing Risk

A great use case for managing and reducing risk by adopting an ARMP can be found in the aviation industry’s maintenance, repair and overhaul (MRO) sector. Aircraft service technicians face heavy pressure to get airplanes back in the sky, but also know that they must rigorously follow every procedure to the letter – and provide verification of having done so – in order to ensure safety.

A keen understanding of the role that AR technology can play in this situation was demonstrated in April of 2018 when American Airlines joined forces with Atheer to create an “event” for competitors in the MRO sector’s annual “[Aerospace Maintenance Competition](#)” (which is an Olympics-style event of aerospace maintenance technicians during which they test their skills against one another in the performance of many essential aerospace maintenance tasks).

Coverage in [Aviation Week](#) explained what happened when competitors arrived at the AR station and were confronted with a scenario consisting of an MD-80 central control panel and a pair of AR glasses equipped with Atheer's enterprise AR software.



“The event tested a technician’s ability to create step-by-step guidance to help a colleague through a task, place a video call to a remote expert and send a photo for remote collaboration,” explained Lindsay Bjerregaard, digital editorial producer for Aviation Week’s MRO portfolio. “Competitors ultimately had to use the AR technology to collaborate on setting switches on the MD-80’s panel in the right place and sequence.”

Reviewing the Value Delivered by Each Pillar of the ARMP

With a clear understanding of how an ARMP can help enterprises meet their three most important business goals, it is worth turning to a more in-depth view of how each of the ARMP pillars brings benefit to the organizations that adopt them.

We start that view by taking a more in-depth look at how the contextual and predictive elements of an ARMP work in an enterprise.

The contextual, prescriptive and predictive extended enterprise

There are several kinds of transformative business changes that both context and prescriptive and predictive guidance will make possible. All are driven by:

- The power of having specific, real-time data about the granular work undertaken across your enterprise – as well as the broader supply chain.
- The clarity enterprises gain from being able to see which business processes are most effective, what happens when those processes are tweaked based on data and the body of “prescriptive” guidance produced as a result of this knowledge
- The accuracy and productivity improvements that organizations enjoy from being able to predict everything from maintenance to scheduling to overall task management.

We start by leveraging context to bring all the information we can about the work someone is (or a group of people are) doing to bear on helping that person or group be more effective.

An ARMP uses information about the work identity of an individual (drawn from their profile and including things such as skill set data, historical data covering the work instructions they have previously worked with, the remote experts they typically work with and what level of certification and training they may have).

It then combines that information with live data about location, time and date, relevant IoT data about things such as temperature, air quality, humidity and anything else which make the system’s understanding of the work at hand richer.

Context is also a vital component of helping the AR platform become more intelligent (though ML and AI technologies) and predictive.

Leveraging both edge computing and AR technologies, enhanced by machine learning and artificial intelligence, creates a platform that can anticipate what members of the extended enterprise will need to do next – sometimes before they know it themselves.

It builds on the idea that an organization has the capability, with the simple introduction of an ARMP, to hold up a mirror to itself and its supply chain to gain true predictive insight in both the specific and broad collaborations of the extended enterprise.

Working on the device, form factor and OS that’s right for the job

As discussed earlier, edge computing is a true enabling technology that will help deliver on the promise of Augmented Reality, but it will take a variety of devices (delivered in a range of form factors across multiple mobile operating systems) for it to be truly effective.

That is why an ARMP needs to be both *mobile-first and device-agnostic*. It is based on the idea that enterprise customers need to be able to start where they are, using technology that makes sense in meeting the needs of their use case, their budget and the change management challenges they identify in their respective organizations.

AR is not a “one size fits all” kind of proposition. Not every AR implementation needs to start with smartglasses – an enterprise’s use case may actually be best supported with AR running on smartphones or tablets.

The kinds of interactions a use case needs to support (such as voice recognition or gestures) may play a role in helping determine how an enterprise will implement an ARMP, but that implementation may start with something intermediate and achievable using what it already has to work with.

Being cross-platform means one thing: supporting the devices (both form factors and operating systems) that customers want to use to become successful with AR in the scenarios and use cases that are meaningful to them.

It is important to ensure that enterprises can leverage existing hardware investments as well as “future-proof” their AR platform investment by being assured that whatever hardware/operating system/form factor combination they choose – now or in the future – it will be capable of running their ARMP.

Interactions must be natural, intuitive and support the work at hand

Augmented Reality Management Platforms need to offer the right interaction choices to support the business use cases within extended enterprises.

Just as an ARMP needs to support the broadest possible set of form factors and operating systems to ensure customer choice and solution flexibility and scalability, it also must support the four most common ways to interact with the augmented reality technology – ensuring that the ARMP can support the most number of hands-free use cases and offer enterprises and their workers choice in how they interact with our AR platform. Those choices are:

- **Gestures** – Most smartglasses used in AR have front-facing cameras that offer the ability for the glasses to “see ” what a user sees – and be able to interpret the motion of a hand in front of them. Gestures are a great way to precisely interact and are perfect for dirty or loud environments. To be effective, an AR platform needs a precise and efficient hand tracking algorithm can enable the smartglasses to take advantage of an on-board RGB camera or depth sensor to recognize and respond to gestures. This provides a true hands-free working experience.
- **Voice** - There are some situations when gestures are not ideal. These include situations where a user’s hands may be occupied with tools. In that case, voice commands provide an important and safe alternative for interacting with smartglasses. Ideally, you want to be able to add voice commands to your smart glass system actions and allow your developers to define voice commands to extend their apps.
- **Gaze** - In situations where voice commands and gestures are not suitable, (such as noisy environments), gaze is a great alternative. It can allow workers to access and scroll between content (including video feeds) and the detail of images, maps, and 3D models without using their hands.

- Touch – A good ARMP should provide support for industry-standard touchscreen devices so that workers using popular phones and tablets can leverage key AR features (including video conferencing, on-screen guidance and documentation such as shop manuals) when they are working in environments where they don't have to use work gloves or carry tools in their hands. This form of interaction could also apply to the touchpads on many popular models of smartglasses.

In short, interactions must be natural, intuitive and support, rather than get in the way of, work.

Collaboration will get better, between individuals, teams, enterprises and their supply chains

For an ARMP to be effective and truly enterprise-ready, it needs to allow workers to bring the right expertise to a problem at the time of need, regardless of where that knowledge lives across an enterprise or its supply chain. This is a critical business competency and a key differentiator for enterprises who excel and grow rapidly.

To support this goal, an ARMP needs to support a variety of video calling scenarios including one-on-one "See What I See" video calling, one to many (to support the supply chain and extended enterprise, as well as some training scenarios) and many-to-many (also for training) - as well as supporting text messaging (particularly useful in noisy environment).

With multi-point collaboration and group calling, a user can securely bring in multiple remote experts to troubleshoot problems over live video. This is of huge benefit in situations where multiple suppliers from the customer's supply chain are responsible for different elements of a complex piece of equipment or process and provides the enterprise with the power to drastically reduce the time and cost needed to arrive at a solution.

Also part of the ARMP collaboration vision is support for in-line note taking (photo, video, voice recording and automatic transcription) across all business processes. This allows an organization to maintain a real time record of the work being done across the enterprise for optimization, training, and compliance purposes.

In addition to support for these AR-supported remote expert calling scenarios, another vital aspect to a good ARMP is the design and delivery of work instructions to a worker's field of vision.

With work instruction creation, publishing and analysis features in an ARMP, it becomes possible to not only build great secure, encrypted work instructions that help guide employees through often complex work, but it also to gain greater understanding of how effective those work instructions are. Data about work instructions allows organizations across the extended enterprise to:

- Get real-time information about which work instructions each user has undertaken - There's no point in putting a lot of time and energy in developing in-depth, detailed work instructions if your workforce is not going to adopt them. Being able to see which of your employees is using a particular set of work instructions can be a big help in understanding why it may not be working. It could be because users are unaware of the availability of the work instructions, that there are problems with the work instructions themselves - or that particular users are finding it hard to adapt to new ways of working and perhaps need more training and encouragement.

- See how far each user gets in executing those work instructions - This is vital in getting a more detailed understanding of how successfully a given work instruction is being adopted by the enterprise workforce. It can also be used to provide insight about whether refinements or improvements are needed to a particular step in a set of work instructions. If, for example, data shows that most users are halting work on a 10-step work instruction at Step 4, it will be clear data that there may be problems with either the instructions provided or in some aspect of the work itself within that step. Enterprises can then talk to users, figure out the issues they are having and then refine the work instructions so that they can be used more effectively.
- Identify how long it takes each user to execute on a given set of instructions - In designing a work instruction for a particular task, enterprises will often have a target timeframe in mind for how long it takes to accomplish each task. With the work instruction reporting in an ARMP, enterprises can see exactly when each step in the work instruction was started - and any times when users had to pause and resume any part of a work instruction. For work instruction designers, this is powerful as it again helps them understand whether the work instruction is actually helping employees to be more effective.
- Make sure that all users are working with the very latest version of work instructions – Work instruction synchronization in an ARMP ensures that as complex task flows are improved and updated, they are immediately available to all connected users. It ensures that the workforce has immediate access (via their smartglasses) to the very latest updated task flow guidance so that they can do their jobs in the fastest, safest and more effective way possible. This is particularly important in dynamic environments where processes and workflows can change quickly. It's also very useful when new compliance rules need to be reflected quickly in work instructions.
- Collect and store work instruction data locally – ARMP users shouldn't need to be connected in order to get the full benefit of work instructions. A well-designed ARMP should track the use - and effectiveness - of a given set of work instructions, even while the smartglasses (or other mobile devices) being used to deliver the work instruction are offline. For a workforce that carries out maintenance work underground (on perhaps a subway line or in a mine) and there is no data connectivity, those workers can still load work instructions onto their AR device while they have connectivity, do the work detailed in the work instruction and then have the data about that work automatically uploaded the next time they connect to their network.

An ARMP provides a great way to not only assess the effectiveness of work instructions - and drive changes to those workflows based on the actionable business insights enterprises are getting about them - but also to quickly make the most up-to-date task flows available to your entire workforce.

All assets are digital and will need to be delivered and managed where and when they are needed

From digital twins to PDFs of user manuals to instructional videos to IoT data and 3-D CAD models, all the key assets in an extended enterprise are digital. Those assets need to be available where, when and how they are needed – with contextual information helping to bring the most relevant assets to light at the right time.

Digital Asset Management means being able to handle many objects – including workflows and work instructions (such as task flows, check lists/pick-compliance lists, SOPs), objects (PDF, 3D, pictures (such as PNGs and JPGs), video and audio files, and surveys.

The ARMP must also provide the tools to be able to manage these assets – including import/export, creation, editing/deletion and versioning of them.

It is also vital that the approach of the ARMP in managing digital assets starts again with enterprise customers where they are. The system should not require a costly and time-consuming amount of scanning and work instruction recreation to begin getting value from it. It should allow customers to start with simple, authored work instructions, PDF versions of existing documentation and access to any existing video and other support materials – and then create more elaborate digital content as they learn from the company's workforce about what will be most useful to them.

The important thing is that the ARMP helps customers begin realizing ROI from the outset – and then allows that ROI to scale as the experience for workers becomes richer and more capable.

Data and insights at every level (individual, team, company and aggregate) will be vital to delivering and supporting context -and delivering predictive and prescriptive guidance

No enterprise is going to roll out an ARMP that doesn't provide a great way to see, track and measure its effectiveness. Our vision calls for multiple performance dashboards, at every level of granularity – from the individual all the way to up the extended enterprise.

For example, on an individual level, an ARMP dashboard should show live and historical information such as the average time taken for each set of work instructions, perhaps even down to step-level granularity on work instructions. It should provide data about collaborations and digital interactions (with details of what happened with each collaboration event).

You should have that same kind of data at a group level (for multiple people), across a department, location, plant, entire company or across an extended enterprise covering a company and all its connected suppliers.

Meanwhile, to allow the ARMP to continuously learn and improve, there should be an provider-level dashboard (with drilldown at the tenant level, feature level, showing messages, calls, digital assets used, success/failure rate, use frequency, anonymized data, objects exchange or shared). It should also offer network metrics (such as data about bandwidth, throughput and speed) and capture the mean, median and average data on task flow execution (down to step level, task flow level and individual user level).

It would also include company average data for common task flows (so companies could benchmark themselves against others who have common use cases) as well as providing companies with access to their own averages. These dashboards could also provide access to compliance data collected by the AR platform.

Enterprises should also be able to customize dashboards to highlight their own ROI goals. If, for example, the business goal of implementing an ARMP is that the enterprise wants to integrate with an existing Warehouse Management System (WMS) to reduce error rates on item picking and packing in the warehouse, then the ARMP dashboard should allow customization to include and display that data for all users (viewed either within their AR device or remotely via a Web-based portal).

Finally, this data could drive the communication of automated alerts (activated by anomaly detection) and survey results (at end of collaborations) to improve safety and broader company communication.

Any AR platform has to work and be ready for the enterprise and the extended enterprise

To be truly enterprise-ready, an ARMP needs to offer Reliability, Availability and Security (RAS) – those are table stakes for enterprise systems.

Then it needs integration (with ERP systems, service clouds, WMS systems, PLM systems, content management systems, data repositories, active directories), scalability, extensibility – as well as the “see what I see”, work instruction delivery and appropriate navigation supported.

A good ARMP also must address specific security concerns, as well as IT implementation and device management challenges faced by enterprise customers implementing AR. All of them relate back to the broader challenge of change management - and recognizing that you need everyone on the organization, including the IT department (if not especially the IT department) to be clear on the benefit the enterprise is going to get from doing the work of AR implementation.

Finally, and most importantly, the ARMP must do the tough work of tying together and unifying the data provided by all the key enterprise systems with which it is integrated. It offers the promise of being able to bring the power of all the insights gained across all an enterprise’s management systems to the field of view of each “augmented” worker.

To be sure, the information that its appropriate for different parts of the workforce to have displayed to them will depend a great deal on how and whether access to that information will help them work more effectively, more safely or with greater satisfaction. But if the ARMP is the unifying force across all the available data, then the millions of deskless workers who are expected to adopt AR (and the organizations for which they work) will have choices they never had before.

Imagine working in an industrial setting and your only easily accessible access into worker safety was the sign on the wall showing how many days it has been since the last “safety incident”. A broadly-available ARMP, no matter which devices are used to access it, has the potential to put much more information in the hands of the workforce – and allow them to do their jobs more safely and effectively.

The Augmented Reality Management Platform is Real and Ready

The very best news about the advent of the ARMP is that it is real, ready and available for demonstration now by Atheer.

The work involved in developing the world's first ARMP combines Atheer's six years of insight and experience in initially developing AR devices and then delivering and implementing AR enterprise software solutions for some of the world's leading companies.

We look forward to bringing enterprises their first look at an ARMP.