

A beginner's guide to augmented reality for manufacturers



Training teams and transferring knowledge

Evaluating new concepts or floor layouts

Identifying health and safety or workflow issues

Assisting site surveys and ensuring traceability

Aiding maintenance activities

Receiving expert assistance remotely

Reducing the length of the sales cycle

How to adopt AR in your manufacturing business



Augmented reality (AR) is incredibly valuable in manufacturing. However, its usage is relatively low, particularly amongst businesses with fewer than 250 employees.

Some makers consider it to be far-fetched and too costly for their processes. But it should be taken seriously as an option. It has many simple applications which can solve a number of typical **business challenges**.

Here, we take you through its benefits and how it could make a huge impact to manufacturing businesses of all sizes. Read on for our beginner's guide to AR...

Immersive training and knowledge transfer

If you, like many makers, are facing an ageing workforce and need to train the next generation, this element of AR will be extremely valuable. With this technology, writing manuals for new starters has well and truly become a thing of the past.

Through special AR tools, the knowledge of your experienced team members can be captured and disseminated to fresh talent in order to prevent a void or lack of available skills. These tools can capture what your current team does every day, and they can provide written prompts or a voiceover explaining their actions too. Given that so many of us learn by doing, the result is an effective and efficient on-the-job training environment that enables up-and-coming staff to quickly get to grips with your processes – future-proofing your organisation's knowledge retention.

We've found that this teaching method is quicker, easier and costs less as it can be carried out without the presence of an instructor or mentor. Business owners additionally no longer have to lose days to staff training or see their production impacted, and training content can be reused and developed over time.

Conceptual design evaluation

If you're considering expanding or redesigning your factory, you may find AR's visualisation capabilities hugely insightful. You'll be able to see what it would be like in true context and test the layout and design without having to fork out for a new factory first. This makes you better able to pinpoint potential access issues or optimise movement around the factory floor. It can also speed up decision-making and prevent costly mistakes.

Even if you're not thinking of a full-on factory redesign, AR can still help with small changes. For instance, one such use case that's incredibly relevant in the era of social distancing is overlay arrows on the floor or markers to effectively direct staff. Alternatively, if you're looking to make your factory greener but aren't certain how changes (such as relocating machines that do not require human input to a 'lights out' environment, or repositioning air cooling or heating units to maximise efficiency) would affect the movement of employees, you could test them out via AR.

Work cell design and validation

Through AR, you can sit literally anywhere within a virtual work cell during concept and through the design phase. In this way, you can go beyond sustainability and identify any health and safety, ergonomic or workflow issues that exist in your factory design, as well as their potential impact on your workforce and processes.

You can practise all sorts of scenarios to examine operations, ease of carrying out tasks, and access to materials and tools. As a starting point, we'd suggest establishing whether workers would be able to reach their required equipment, have room to stand up, or are in very close proximity to others.

The technology can provide prompts and alerts too, as well as health and safety reminders. When an employee enters a room, for example, they could be notified to wear a hard hat or PPE. There's also the opportunity for guided learning through graphics and prompts that appear as if in the real world.

On the subject of health and safety, you can see if any training has been effectively absorbed through the use of AR. Workers can be placed in an augmented environment to experience a hypothetical scenario that would perhaps be deemed too risky in real life. This will help you to see whether employees would carry out the appropriate safety protocols – and, if they don't, take the necessary action to ensure they're retrained.



Assisted site surveys

When AR is used for assisted site surveys, you'll be able to guarantee that all data is captured and retained. It can even be captured by trainees or lower-skilled personnel through instructions and guidance. Such evidence will also **ensure traceability**, meaning that AR has an additional use in the event that an investigation is launched to prove scheduled maintenance was carried out at the appropriate juncture.

AR would also allow you to verify or identify issues, or situate sensors to activate alerts. For example, if the oil temperature inside a vessel was too high, you could put on smart glasses and authenticate it. You're effectively looking with 'X-ray eyes' into the machine, whilst being fed real-time information from a live database. **Playdale Playgrounds** is looking to use 3D laser scanners for their site surveys, reducing downtime and allowing for predictive maintenance.

Another idea is picking components for subsequent product assembly or simply putting a kit list together. Wearing AR smart glasses can reduce the time, human error and waste associated with this activity. They can be used to direct a worker to the right location, and then confirm that they have picked the correct components.

Assisted maintenance procedures

There are many ways in which AR can aid a worker through maintenance activities. For example, gazing at a QR code through smart glasses can automatically invoke an application that then prompts a worker with a series of instructions to highlight each step of a process. Colour overlays can be used to enhance the parts that require attention, enabling a task to be completed quickly.

Or, AR can use an animation that delivers the same step-by-step prompts to show the user around the machine in question. These can even be in audio format if required.

On top of this, there's the option to pre-code these at the design stage, which would be especially helpful to your typical processes. This will make it much more straightforward when it comes to training new members of staff or upskilling your existing team. It will result in a much quicker process, and a much higher chance of maintenance issues being fixed the first time round.

Remote expertise

Related to assistance is remote expertise. Using AR, a factory-floor worker can take a video or snapshot, annotate it, and share it with an engineer or consultant. That expert can then provide real-time assistance by identifying a screw, panel or any required changes, without having to be there physically.

Remote expertise is very simple to deploy and will provide you with a safety net that limits any potential downtime. The result will be a quicker diagnosis of any issues and both time and money savings.

Sales and marketing

AR can reap rewards outside the realms of the factory floor as well. For instance, you can improve the customer experience, resulting in an increased chance of developing opportunities. One such idea is to give the customer the chance to visualise different product options, either in context or merely in free space in front of their eyes. A related example is handrail manufacturer **Handrail Creations**, who are planning to use a mix of AR and VR to enable clients to see their own designs.

Using AR in this sense could be incredibly beneficial for your business' bottom line. The virtual experience will result in a more impressive service, in turn leading to more marketing opportunities, boosted customer satisfaction and a higher likelihood of repeat custom.

Or you could use the technology to provide a factory tour to remotely located customers, suppliers and investors. You can simultaneously give them the power to choose the route you might take by enhancing your visuals with overlays coupled with two-way audio communications. During times where in-person presence just isn't an option, this technology can accelerate stakeholder buy-in while saving precious time for all parties. And on top of this, there's little environmental impact – which will help to enhance your reputation too.

You can show what would normally be impossible on a physical visit as well, demonstrating in greater depth how your machines and processes work and cutting down the length of the sales cycle. A great example is always a kitchen showroom. You can take a potential customer behind the scenes, and show them how a custom kitchen will be built precisely to their needs. This is much more likely to result in a better customer experience, and is an incredibly effective sales tool. Parity Medical has achieved something similar with their DriveWorks project – a virtual showroom that allows the sales team to collaborate with the customer on the design, engineering and configuration of an order. As this takes significantly less time (an hour as opposed to a two-day visit), their team is freed up to explore other sales opportunities and the customer receives a convenient service.



Adopting AR in your manufacturing organisation

One of the reasons manufacturers tell us they are reluctant to adopt AR is due to a concern around change or a worry that they'll meet resistance from employees. However, it's important to note that any business disruption or cultural shift can be effectively managed.

We recommend nominating a digital champion within your business – someone who will embrace the emerging technologies, pave the way for adoption, and address the potential cultural issues by demonstrating the benefits to consumers and encouraging others to follow suit. You should also upskill willing team members so that they can embrace the technology and produce relevant content to promote buy-in amongst their colleagues.

There's also the option to experience a virtual line-walk through our **digital transformation workshops**. You'll have the opportunity to explore your operations and identify where AR – or other digital technologies – can benefit your particular business and what the potential cost, time and resource savings could be. **Get in touch** with the Made Smarter team today to find out more.

Alternatively, if you'd like to discover the stories of makers who have adopted AR, you can **view our case studies here**.