

Five Ways AR is Revolutionising the Manufacturing Industry

Augmented reality can bring pharmaceutical manufacturers myriad benefits, such as helping guide manufacturers through their processes, reduce human error, streamline practices, and share information

Patrick Liddy
at UtilityAR

"Simply put, we believe augmented reality is going to change the way we use technology forever"

Tim Cook, Apple CEO at the fourth quarter earnings call, 2017

Prior to 2016, augmented reality (AR) in manufacturing was merely a pipe dream. Now, the potential for AR is recognised in many industries, including pharmaceutical manufacturing. The technology allows workers wearing transparent AR glasses to see both the real world around them as well as virtual information projected on their glasses to help them get their job done. All of this is hands free and at the location where the work is needed. AR is poised to revolutionise the manufacturing plant floor.

Over the past few years, tech leaders such as Google, Microsoft, and Apple have invested heavily in the space, releasing headsets and providing development tools. The result of this investment is a collection of improving headsets and a raft of new software solutions in the space. Similarly, the pharma and life sciences sectors have begun dipping their toe in the water to see how they can get value from this technology. Companies such as Johnson and Johnson, Bristol-Myer Squibb, Merck, Takeda, and Teva Pharma, among others, are engaging in pilot projects to look at how AR can be used in all aspects of their business, including the manufacturing



area. The technology, which offers a unique opportunity for industry to reduce human error, streamline work procedures, and increase workforce productivity, will be widely used by most technical workers in a few years. There is an opportunity for leaders in the industry to gain advantage by being early adopters and embracing this step change in how work is done.

AR aims to produce efficient operations by reducing production downtime, quickly identifying problems and maintaining all services and processes.

Problem Solving

When faced with problems, assigning the correct person to the job has always been essential. The worker sent to fix the issue must be adequately trained in the

required area, and workers experience will be key to their likelihood of solving the problem. This can be resolved easily if you understand the exact issue in advance, but what if the nature of the problem is unclear or there are multiple problems to solve, how can they be expected to be an expert in them all?

With AR, workers can do remote adviser video calls with more experienced colleagues to resolve issues. Their colleagues can see live videos and sound from the AR glasses on their computer screen or table and draw annotations on the vision of the glasses to help the wearer diagnose and resolve issues immediately.

Pharma manufacturers are using this functionality to allow their local engineers and technicians to share



information with colleagues or partners who are off site. This may be off shift co-workers, staff at international sister sites, or hardware vendors in other countries. Inputs by more experienced eyes can help solve problems much more quickly, and, often, the input required can be extremely small. The savings that can be enjoyed through this feature are very significant, as they can be measured in the order of days on each occasion it is used. It also means the best person will weigh in on an issue and improve the likelihood that the correct solution is used.

Work Faster and Improve Record Keeping

Engineers and technicians are required to work on a multitude of different pieces of equipment in their workloads. This complexity demands that procedures be drawn up, particularly for tasks completed less frequently. However, following these procedures is unwieldy as having the instructions to hand while doing the job requires extra hands that a worker simply doesn't have. Additionally, finding the correct procedure for the job can be time consuming.

Using QR codes or image recognition, AR glasses can identify the asset that an engineer or technician is working on and show them in their vision the correct procedures they should follow to complete the work they need to get done. The procedure can be broken down into simple steps, and with the aid of images or video, can guide the worker through the task while leaving them hands-free to complete the work. With this method, accuracy of workers can increase significantly as their adherence to procedures will improve. An increase

in speed due to reduced need for referencing other documentation is also welcome.

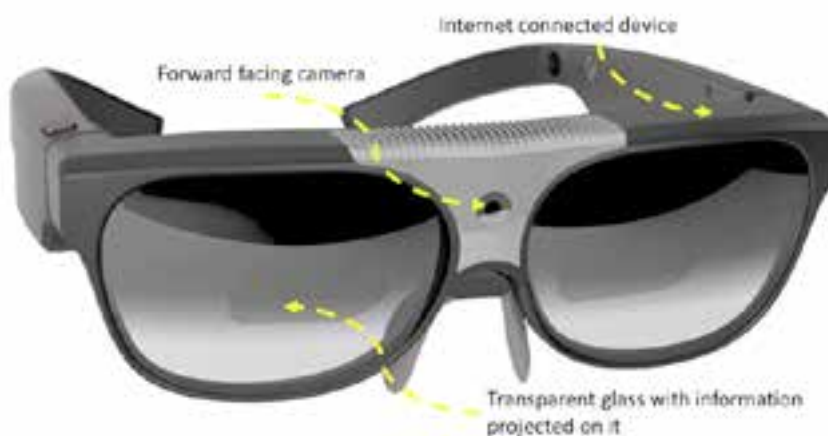
The worker can also use the headset to take images and video to validate that they have completed the work correctly or take notes as they go. This improved record keeping can add significant value when it comes to understanding if a system is in a good state or when audits arise. The speed and simplicity of the solution is very attractive to all involved.

Easily Access Data

Similar to the functionality relating to procedure following, the technology can recognise a machine or asset that a worker is looking at and show them

relevant information in their glasses. This may be general information about the asset or real-time data received from a dashboard or meter. In some cases, it may link to other video cameras to allow the worker to see more than one perspective on the machine. The AR-enabled glasses will scan a QR code, barcode, asset number, or other markers associated with the asset and display the required information. This improved access to data can result in insights that will have a profound effect on quality, reliability, and performance. The opportunity to link information to physical assets in the real world is one of the most exciting elements of AR glasses and wearables generally.

Pharma manufacturers are already using this functionality to test the potential for viewing live Internet of Things (IoT) dashboard information on assets in their production lines. This would mean that an engineer or technician can walk a line and see production rate, temperature, alert status or batch information overlaid on different parts of the line as they look at them.



“ The opportunity to link information to physical assets in the real world is one of the most exciting elements of AR ”

Reduce Production Downtime

Production downtime due to machinery breakdown is costly and is regularly one of the top metrics on which a pharma manufacturing team is measured. Actions that reduce the regularity of breakdowns are a major part of any maintenance cycle, and reacting swiftly to a breakdown when it occurs is critical. Breakdowns are highly stressful and important times in any manufacturing organisation, and taking actions to deal with them is imperative.

With the help of AR, the team can quickly bring in the best expertise via remote adviser calls from vendors or contractors to identify the problem and get the equipment back up and running swiftly. The team can visually identify the problem and resolve it there and then, availing assistance from the most experienced person if needed. The level of communication that can be achieved using AR glasses over phone conversations is significant, and the reduction of stress it can bring to a situation is welcome.

Additionally, the improved accuracy of maintenance work can prevent the downtime from ever occurring in the first place. Improved procedure following and advice at the maintenance stage can have a significant effect on breakdown occurrence.

Training

Training new recruits (and some older ones) is increasingly important in any manufacturing organisation. Current solutions are costly and slow as they consume a lot of time from more experienced workers. Documentation is also an issue as most solutions require cumbersome paper record keeping.

AR glasses have demonstrated great potential when it comes to upskilling and training. Rather than training via Powerpoint or Word documents, operators can be trained using AR while standing beside the real assets.



Similar to the procedure mentioned above, workers can see video or images about how to complete a task while standing beside the equipment in question. This improves the rate of understanding and knowledge retention. It can also ensure workers are adequately trained in new ways before working with dangerous or complex machinery.

As AR is a digital solution, it also has the benefit of providing a clear and auditable digital trail of time stamped training completed by a particular engineer or technician. This information can be used in management systems and audits that are an increasingly important part of the pharma industry.

The technology can also be used to test a technician by loading a quiz to be completed on location at the equipment by the technician. A trainer can watch the technicians completing the quiz and if required give them guidance as they go. This solution can increase knowledge retention and decrease training times by providing a more immersive training experience to workers.

As discussed above, AR is bringing a new paradigm to the pharma industry in the way technicians and engineers interact with technology and complete their work on a daily basis. The technology partners work well with other data and IoT projects that organisations may be rolling out, so

the time to act is now. The opportunity for first movers to get an advantage is significant, and we expect that over the coming 24 months a major move in this direction is coming.

About the author



Patrick Liddy is a qualified Electrical Engineer BEng, CEM, MIEI from University College Dublin, Ireland, and holds a diploma in Business from Dublin Institute of Technology, Ireland. He brought innovation to the electricity market by founding Activation Energy, an energy efficiency software platform working with large energy users, and, following an acquisition by Nasdaq listed EnerNOC in 2014, led the company to be the largest demand response company both in Ireland and the UK. When Patrick first encountered AR smart glasses, he was convinced the technology would change how industry gets work done. In 2017, he re-entered the entrepreneurial space, founding UtilityAR, an AR software developer that creates AR solutions for utilities, industry, and other organisations who manage large portfolios of physical assets. The company now boasts local and multinational clients in the data centre, pharma, and utility sectors.