HERE FROM THERE

Augmented reality (AR) is gathering more and more momentum, particularly within vehicle workshops and factories, as a means of adding a layer of computer-generated material to the real-world view of the operator, superimposing images and feeding in audio information directly. Lucy Radley reports

Augmented reality (AR) has obvious potential to aid interactions such as remote fault diagnosis by geographically distant experts, and can be accessed in many different ways – via tablets or smartphones using the built-in camera, for example – but the latest versions involve specifically designed headsets, which come at a hefty cost. Three applications of AR were examined to see if it's worth the expense.

IVECO Bus is now using Microsoft's HoloLens glasses in a dozen dealerships and workshops across Europe to aid remote assistance, with the aim being to "minimise downtime by streamlining and enhancing interactions with service experts".

Effectively a computer, the HoloLens weighs 579g and contains three processors powered by an adapted version of the Windows 10 operating system. A CPU (central processing unit), GPU (graphics processing unit) and HPU (holographic processing unit) deliver visual augmentation, while infrared cameras and 360° surround sound further aid the information-sharing process.

As well as letting technicians work with guiding experts while remaining handsfree, HoloLens goes further by enabling both ends of the conversation to see what is happening, and allowing images to be added to the workshop-based view. "The key advantage is that back-office technical helpdesk staff can share documents – schematics, pictures, videos, etc – directly with the operator through the glasses to explain what intervention is required," says an IVECO spokesman. The software used also allows graphics to be directly drawn into the technicians' view, such as pointing arrows or rings around relevant components to highlight them, for example. Operators talk to each other directly via Skype.

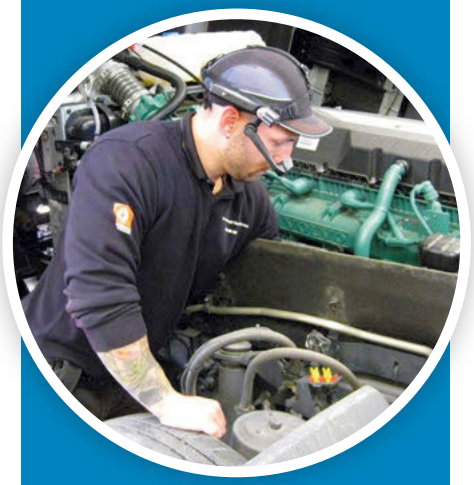
"The HoloLens system works in conjunction with IVECO's technical

reporting tool in global use throughout the dealer network," our spokesman says. "The support is organised and managed as needed, the technical helpdesk technician contacting the dealer technician should there be a difficult intervention to resolve." While the HoloLens itself is not cheap, at around €3,500, there is no monthly contract or fee payable by the dealership to use the facility.

VW Commercial Vehicles is using a similar system within its network of 71 van centres and 26 authorised repairers. "We're using a headset made by RealWear, which connects up to the Wifi within the dealership," states Paul Armstrong, service and parts programmes manager. "We as a technical team can see what the technician can see, and we can also take remote control of the headset so we can switch on lights, zoom, and start to augment images into the view of the technician." This is done via a small screen, which is mounted just in front of the technician's eye and to him or her appears the size of a seven-inch tablet. The RealWear headset has noise cancellation built into the microphones and speakers, which means a full conversation can be had and heard without the rest of the workshop needing to shut down and be quiet. It also weighs less than the HoloLens, at 380g, and is drop resistant up to two metres.

The cost of the VW hardware is borne by the vehicle manufacturer rather than the dealership using it, and headsets are kept within the main parts system. When needed, a headset is sent into the workshop with its morning parts delivery, ready for use that day. Deployment is arranged via the existing technical support service. "We're talking about master technicians here, so these conversations are high level in content," Armstrong says. "Within our existing portal, they already have the ability to use instant messaging and upload a photo, and we can take remote control of the diagnostic tool plugged into the vehicle, but we were always left without being able to see what the technician could see," he continues. "This gives us a third channel with video and the augmented images we can put in place.

"At a very basic level you could use a phone or tablet, but we're talking about complex problems here; this isn't for day to day," Armstrong says. The added cost can be justified in several ways, not least a reduction in downtime. "Customers tell us it costs around £600 per day to have a vehicle off the road, and in the commercial world that's not on." In the past, if a problem seemed particularly intractable, a support technician would have to visit the workshop in question.



RENAULT'S STORY

Augmented reality headsets could soon have a major impact on the way workshop technicians operate, believes Renault Trucks. It is now introducing an Optiview RealWear HMT-1 headset to its network's service and repair departments. Operated in conjunction with LibreStream Onsight Connect software, it allows users to connect handsfree with Renault's technical experts hundreds of miles away to obtain real-time help and advice while they are working on vehicles.

Individuals wearing the headset can access a virtual seven-inch tablet that sits below their line of sight. The user interface is voice controlled.

"It marks a new era where wearable augmented reality and voice command technology becomes the norm in our workshops and out in the field," says Derek Leech, Renault's UK service market and retail development director. "The headset is the ideal wearable choice for technicians, giving them the support of the technical team right when they need it to speed up diagnosis and repair."

It can be used to refer to service and repair manuals and in future may be used to help examine parts that are subject to warranty claims. Warranty payments should be authorised more quickly as a consequence.

Those headset-wearing workers will increasingly be made aware of exactly which vehicles are coming their way and what will need doing to them. Renault Trucks is rolling out a predictive maintenance package across 15 countries and it is scheduled to arrive in the UK next year.

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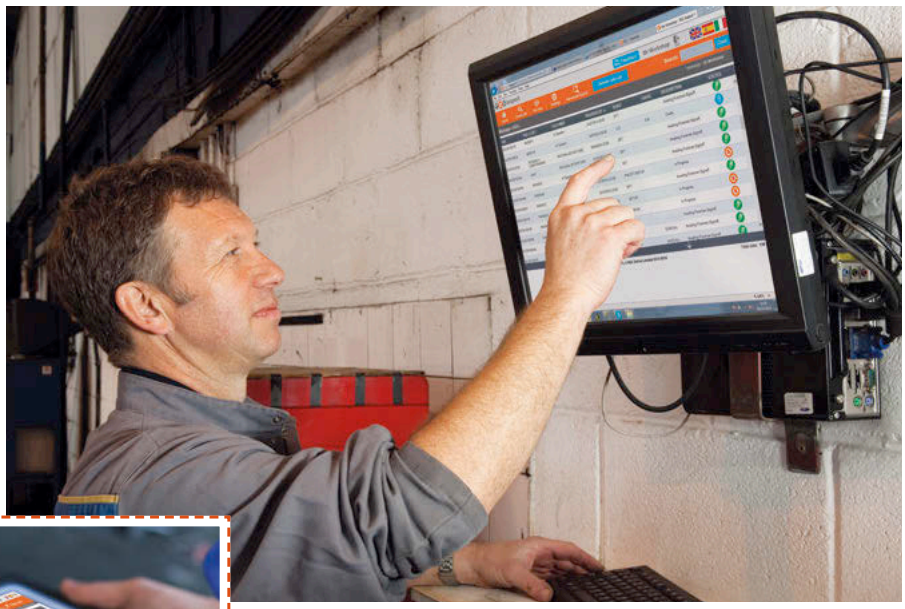
Nick Walls



"That could be in Scotland, the South West, wherever, and typically is a three- to four-day operation," Armstrong points out. "This system is something you can get out in a few hours."

The project has been customer led, but there are savings for the OEM, too, not least in travel and accommodation costs. It is also able to send help into dealerships far earlier in the diagnostic process. "This is the right thing to do for customers, but commercially it makes sense all round," Armstrong says. The headsets are currently deployed on seven to eight cases a week, and comparison with previous methods shows a decrease of around 130 days of vehicle downtime in the first five months of this year. There have been savings at the support centre's Milton Keynes base, too. "These higher level technicians are an expensive resource in themselves, so if they can solve several cases in the time it would have taken to solve one, there's an efficiency there as well. Plus the dealership staff are happier, as they feel far better supported," Armstrong adds. "We hadn't considered that, so it's a breath of fresh air!"

AR is accessible to smaller operations, too. Sheffield company r2c Online has been marketing its Smart Inspect app for some years, and has now updated it for use with a headset. "It's an evolution of our tablet-based inspection system really," MD Nick Walls says. "We were looking at ways in which we could free the hands of the technician, capture information live and connect to others." The result is an array of solutions – Smart Inspect isn't tied to any particular hardware.

At its most basic level, the AR version of the system runs through its standard inspection questions audibly, rather than on a screen. Voice recognition allows the technician to answer, then continue through further questions which the Android computer combines to produce a report file. "Alongside that, it's got video capabilities," Walls explains. "So if there is an issue the technician can call up the camera and livestream the video content to another person, be that someone internal – say a resident expert in another country who can help fix it – or a customer." This could speed up gaining authority to complete an additional repair, for example. "It means the customer has a window into the workshop without physically being on site."

The big potential obstacle to all this is, of course, financial. "The main cost is in the choice of hardware," Walls tells us. While r2c doesn't supply this, it will help operators to find the right provider. "The lowest-cost entry model of the system is our software on a smartphone you already have, connected by Bluetooth to a set of earphones. Then it depends on the environment in which the customer is operating – if that's out in the field in a van, they possibly don't need the expense of a headset."

r2c's top end recommendation is the same RealWear headset VW has chosen, which retails for around £1,300. But there are other options between the two extremes. "We did some work on Google Glass as well, for example," Walls says. "That is perfectly capable of doing the same thing, but it's not industrialised, so again it's back to use case."

After that, the software is the important bit, and that can be used for a reasonable monthly subscription. "It doesn't matter to us what hardware they're using it on," Walls concludes. "There are no additional costs around the choice the operators make from that point of view." And perhaps this is the solution for those wishing to try AR technology in their workshop operation: start small with an existing device to see whether these systems might be useful, before shelling out for more expensive hardware, whatever that might be. TE