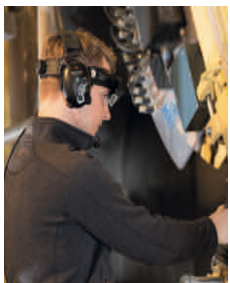




# Lending a hand from afar



**Remote guidance works in tandem with remote monitoring technologies**

*Audio-visual tools and even augmented reality are increasingly being used in plant maintenance. Combined with remote condition monitoring, this opens new opportunities for maintenance and service teams, as Mark Venables discovers.*

It's an iconic scene from TV series and Hollywood blockbusters. Our hero is trying to disarm a bomb. "Cut the blue cable," says the expert, sitting at a safe distance, in the hero's earpiece. "There is no blue cable," gasps the hero in desperation. And on it goes. How easy it would have been for the expert to guide our hero to a successful outcome, had he only been there to see the challenge for himself.

Well, the future has arrived. These days, many maintenance organisations use visual aids to communicate with experts from a distance, as technology has reached

a point, and become sufficiently widespread, to make this feasible. Using a free package like Skype or TeamViewer, an instructor at a service centre can easily exchange video and audio feeds with a user somewhere else.

But technology is now taking another leap forward, with the introduction of augmented reality (AR, see box, below left). This enables the parties to the conversation not just to see each other, but also to closely monitor and follow each other's movements.

## **Serving customers remotely**

Futura is an Italian manufacturer of tissue converting lines, with customers spread globally to be close to the markets they serve. As most of the machines are located in far-flung places, Futura developed a remote support package, branded Procure. However, as it turned out, this wasn't always enough.

"Despite offering our customers a variety of integrated communications tools, we still lacked the ability to actually see a customer's problem or visually guide a customer to a solution without physically travelling to an often remote site," explains Alessandro Viani, Futura's Procure manager.

Futura has now implemented an augmented reality solution from technology company XMReality.

This allows a technical expert at any of Futura's service centres to see exactly what an individual in a remote location sees and to provide that person with visual instructions to solve the problem at hand. The hardware consists of a Windows tablet and an optional pair of industrial smart glasses.

## Technology from games

Augmented reality is similar to virtual reality (VR), which has long been used in training: for instance, in flight simulators. But while VR generates and displays a complete virtual environment to its users, AR displays a real-world environment on the screen and supplements this with computer-generated, real-time audio-visual material. Take this past summer's craze, Pokémon Go, for example, a simple application of AR where the game is overlaid on a background of the actual environment in which the user happens to be.

Technology company XMReality has commercialised AR technology that was first used by the military, in situations not dissimilar to the one described at the beginning of the main article, for use in plant maintenance. From a workstation, a guide can show a follower exactly how to use specific equipment and which actions to take. The guide sees what the follower sees and the hands of the guide are overlaid on the follower's screen to show the precise movements.



planned maintenance," says Ulf Stern, founder of business system provider IFS. "Service providers working with service level agreements that stipulate fault-finding is to commence within, say, one hour of a fault being reported will now be able to meet their obligations more easily.

"Alternatively, they might be able to offer a better service by commencing fault finding within, for instance, ten minutes. In this scenario, the technology can be used to help provide a first line of support. Ad-hoc sessions can be initiated with new users, who only need to download the software to a smartphone to get started.

"If the assistance enables the user to solve the problem without further intervention, both parties will have gained from the arrangement.

"Service organisations can also help improve first-time fix rates by drawing from a larger pool of talent. If the engineer on site lacks a particular skill or requires more expertise to solve a problem, other members of the service team can be contacted remotely. A service provider can use this to build a decentralised organisation where the staff members have different key skills and then use the technology to share knowledge within the team."

The same applies to the knowledge held by an ageing workforce. Staff members nearing retirement often have a huge pool of experience, but they can't be everywhere. Using technology, they can help a large number of young, eager colleagues from the comfort of their office chair.

For remote guidance to work, Internet access is necessary. As long as there is wireless broadband or mobile coverage available, all technologies work fine. However, if the coverage gets patchy, the free technologies begin to struggle.

Skype requires about 700Kb/sec, whereas XMReality's solution can make do with 200Kb/sec. It even works on obsolete first-generation mobile networks. This is achieved by sending data packets that contain both video and audio. Slow transmission speed may reduce the image resolution, but there is no lag and the video stream remains synchronised with the audio under all conditions. ■

**Enter the Internet of Things**

Remote guidance works in tandem with remote monitoring technologies. Leaner production means each component in the plant has to work harder and becomes more significant. Using the Internet of Things to provide feedback from sensors and using cloud computing to move the data generated, equipment providers can use the information for diagnostics and analysis.

This can enable them to take a more proactive role and thus prevent problems from occurring in the first place. If issues do arise, they can easily get in touch with the user, look at the equipment and suggest adjustments. The technology can also be used to connect different parts of a company. For instance, a car manufacturer can use it to support its production line in China. "These technologies open up new opportunities for field service as well as for

*Above left: Technology is now taking another leap forward with the introduction of augmented reality*

*Above: For remote guidance to work, Internet access is necessary*

Industrial giant rolls out augmented reality

Augmented reality software and smart glasses from XMReality have enabled automation and drive system manufacturer Bosch Rexroth to roll out a new service and support programme with remote assistance.

The first Rexroth solution launched for industrial hydraulics is called Hägglunds InSight Live. The support programme involves the client company's own maintenance team in carrying out adjustments, troubleshooting and emergency work, with guidance from Bosch Rexroth's systems specialists back at base.

Using the software with an ordinary smartphone, tablet or laptop, along with the optional smart glasses, the local service engineer works directly with one of the in-house experts at Bosch Rexroth.

"Using XM Reality's platform, we are now able to offer a remote service portfolio, ensuring that help, assistance and our specialist expertise are available for both planned and unplanned

situations," says Rory Moore, service business development manager, Hägglunds Products.

The augmented reality smart glasses enable hands-free operation during the interaction with the service experts, but the software can also be used with just an ordinary smartphone. The service expert sees on his screen what the operator sees through the lens.

The software transfers video and audio streams between the service expert and the operator with perfect synchronisation, even when the bandwidth is low.

Gestures, drawings or instructions can be overlaid by the instructor on the live image.

