THE POWER & VALUE OF TRAINING AND KNOWLEDGE TRANSFER USING WEARABLE COMPUTERS

How Industrial Companies Accelerate Knowledge Transfer to Bridge the Skills Gap

realwear

SOLVING THE INDUSTRIAL SKILLS GAP WITH VIDEO-BASED TRAINING

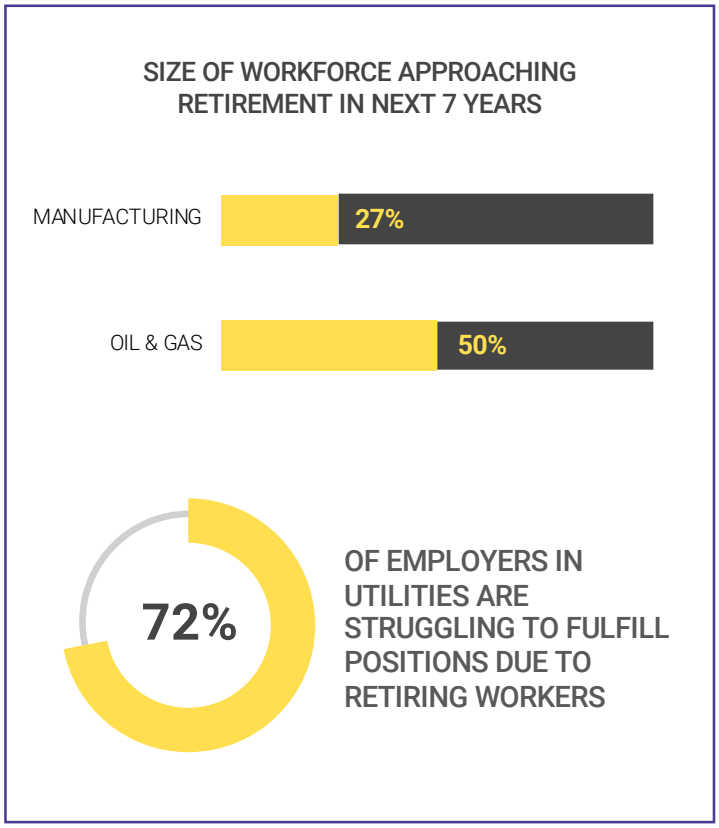
How to deploy wearable computers to effectively train workers across generations.

A whirlwind of forces has created a chasm between the needs of industrial businesses undergoing digital transformation and the skillsets of available workers. While companies have been attempting to address the lack of properly trained workers for years, the lingering effects of the 2007-2009 recession, increasing impact of an aging workforce and widening skill requirements have only heightened the need for a way to transfer knowledge effectively.

Although nearly a decade has now passed since the Great Recession officially ended, industrial companies can expect to feel its shadow for years to come. Many middle-aged and older technical workers in manufacturing, construction, utilities, warehousing, telecom and other industries found other careers—taking their skills and knowledge with them. In many industries, like oil and gas, which saw prices dive during the economic recovery, these workers weren't rehired, and few new workers were brought on board to fill those roles. This caused younger workers to choose career paths outside of industrial fields, and the result has been that that most industrial companies have few middle-aged employees today.

The skills gap is expected to increase across industries.

In manufacturing, 27 percent of manufacturing workers over the age of 55[1] are rapidly approaching retirement age. In utilities, 72 percent of employers are struggling to fill positions due to retiring workers.[2] In aviation, Boeing predicts that 754,000 technicians will be needed to meet demand through 2037.[3] And in oil and gas, the gap between older and younger workers is so large that it's known as "The Great Crew Change." Workers over 55, or the older crew, make up nearly 50 percent of the industry's available workforce, and they're likely to retire in the next seven years.[4]



This bimodal distribution of ages, with older workers nearing retirement and younger workers in need of training has created a hollow middle in the demographics of most workforces. At many companies, few skilled individuals are available to train the younger employees needed to meet long-term workforce needs. A future in which only young, untrained workers are available isn't far off. At the same time, the skillsets needed for most technical positions are growing more complex as the diversity of equipment—and the software needed to operate it—multiplies exponentially. Every year, newer equipment is rolled out, but the older equipment isn't retired, requiring all workers to learn a greater number of increasingly complex systems.

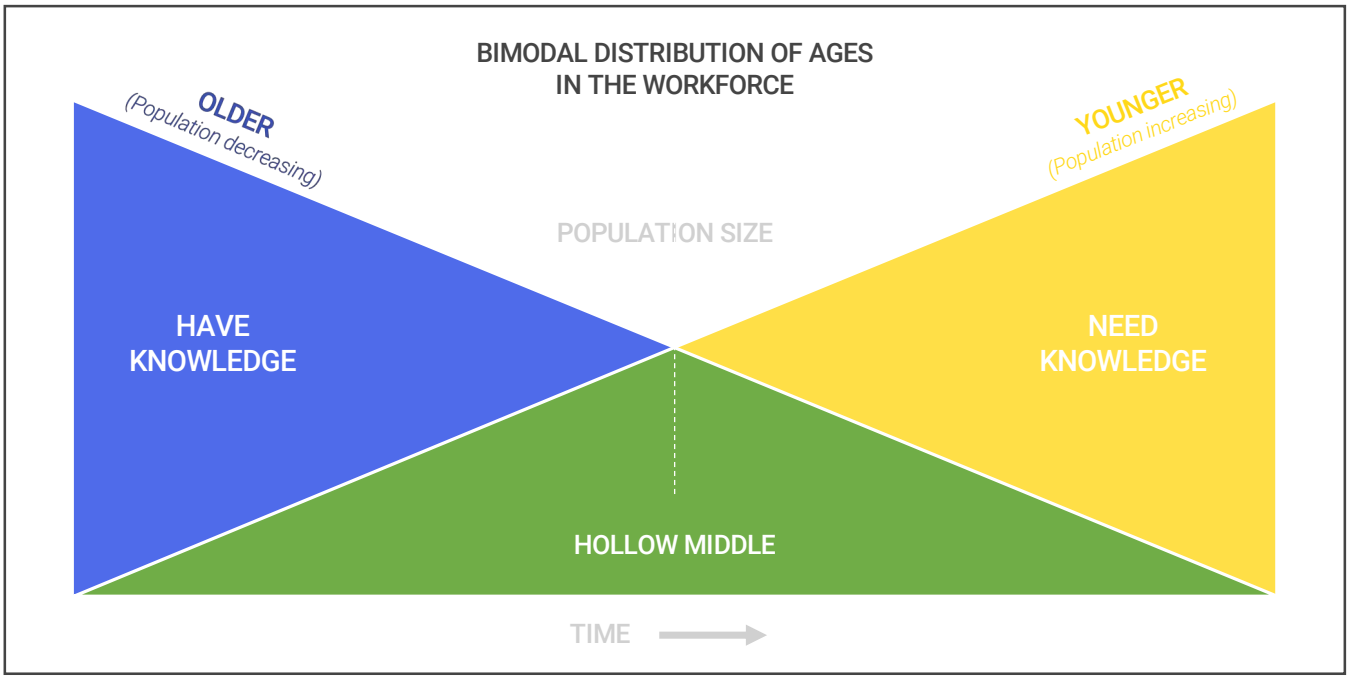
As a result, industrial companies undergoing a digital transformation are facing a significant need to invest in their training programs. In this environment, it is critical to accelerate knowledge transfer between deskless employees of all ages and skillsets to ensure that industrial companies have access to the expertise they need.

Challenges and trends in training

Today, leading organizations are moving towards interactive, video-based learning. Millennials and members of Gen Z are tech savvy, and they don't want to learn with a physical, hardcopy manual or clipboard. They prefer and expect videos for learning and grew up with digital, interactive learning platforms like Kahn Academy and Coursera.

YouTube in particular has become the primary source for all generations to increase their knowledge. Case in point: Nearly 300 hours of video are uploaded per minute,[5] much of it focused on "How To" content. For most people, it's common sense to search for a short, three- to five-minute online video when the dishwasher breaks down or a smartphone isn't working properly.

This is because microlearning, or learning in bite-sized pieces of visually-driven content that is easy to recall and access when needed, is emerging as the preferred way to learn. In the case of industrial workers, it's preferable to access this content on-the-job through short



videos or video calls with experts, rather than in a classroom or through module-based e-learning. This way, young, newer or even experienced workers who are growing their skillsets can receive training while actually completing work—increasing productivity and retention of information.

This makes augmented reality (AR) essential to training millennial industrial employees who must work with their hands and can't safely stop to watch a how-to video on a tablet computer or make a video call to a more experienced worker with a bulky laptop. Gartner predicts that 20 percent of large enterprises will evaluate and adapt AR and virtual reality (VR) solutions by 2019.[6] To overcome the skills gap and enable microlearning, companies must adapt AR-powered, video-first training technology.

That's where wearable computers come in. Wearable computers empower HR and training leaders at innovative industrial businesses to leverage cost-effective AR and video training to deliver the education necessary to train technical workers now and in the future.

THE RISE OF MICRO-LEARNING

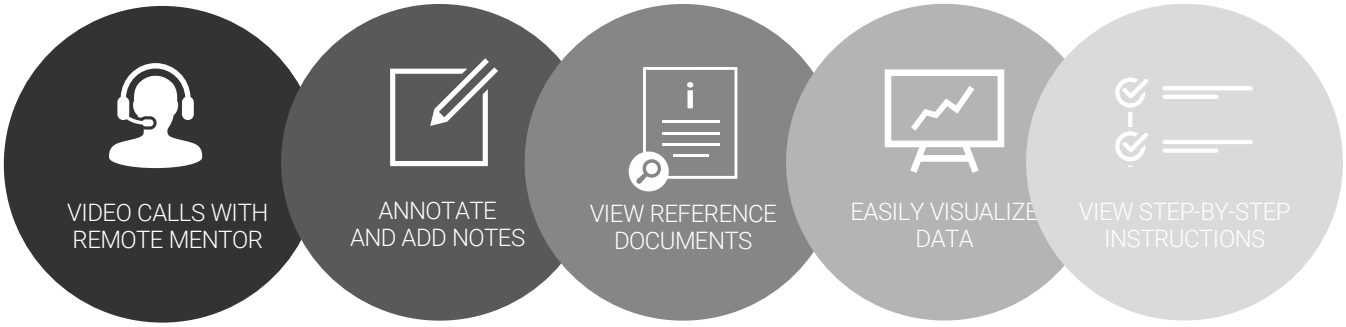
>1 BILLION

learning-related videos viewed on YouTube everyday

1,031 views

on How-To videos on YouTube per second

MICRO-LEARNING IN AN INDUSTRIAL SETTING



WEARABLE COMPUTERS ARE THE NEW PLATFORM TO FILL THE INDUSTRIAL SKILLS GAP.

In industrial settings, wearable, head-mounted computers with extendable boom-arm displays can be attached to safety helmets, bump caps, protective glasses and other gear, enabling hands-free, voice-controlled access for trainees who are learning on the job. They provide an AR environment in which workers can easily use voice commands to watch short training videos, access manuals, view mechanical drawings, look up spare parts and access other materials critical for experiential training.

Wearable computers can be as powerful as a tablet computer and can utilize lenses that make it appear as though the worker is looking at a 7-inch screen. A front-facing camera can be used to make video calls and show a remote expert any problems that a trainee experiences–without requiring the use of his or her hands. Unlike immersive AR or VR systems, purpose-built wearable computers are less likely to distract workers from the task in front of them.

These devices can also streamline the creation of videos for microlearning. Experienced workers can quickly make bite-sized, easily consumable training videos as they work and upload them for instant access via voice search or a QR code on a piece of equipment. Existing PDFs, videos and other references can be easily added to a training program and accessed by an entire team or workforce on an industrial wearable computer. Through this process, knowledge transfer can be achieved far more rapidly, helping to close the skills gap.

To facilitate knowledge transfer across the organization, require that the wearable computer solution you choose for a digital transformation or connected worker program has the following five features:

- Rugged drop-proof and dust-proof design to enable use in harsh environments and reduce downtime for repairs.
- Hands-free voice operation to increase productivity and ensure safety in critical environments.
- Noise cancellation microphone that works reliably in loud industrial worksites.
- Long charge times that can perform through an entire shift, because video streaming uses substantial battery life.
- Intrinsically safe design for use in restricted zones to avoid explosion or fire in oil and gas, textiles, pharmaceutical and chemical manufacturing sites.

NINE STEPS TO DEPLOYING A TRAINING PROGRAM WITH WEARABLES.

Ready to unleash the power of wearable computers in your training program for your enterprise? A few key steps can help you identify areas that need improvement and empower success at scale.

1. Identify and partner with key stakeholders, including IT, early.
   Get familiar with your solution and the ways it can be implemented in your workforce with the help of your stakeholders. IT is the best place to start, as it plays an essential role in video training programs' security and connectivity. You can turn members of your company's IT team into advocates by involving them as early as possible and getting their buy-in. Other stakeholders may include environment, health and safety, digital transformation or connected worker leaders, plant managers and users of the technology.

2. Identify and repurpose existing training content.
   Search through existing training content from internal programs and vendors to find safety and quality videos, step-by-step instructions, manuals, infographics and other data that can be utilized in an initial rollout. If no existing content is available or if new content must be created, have experts capture videos while out on the job. Consider putting QR codes on your equipment to ensure that participants can easily access the right materials with their wearable computers.

3. Ensure users receive training on how to use the device.
   Though the devices themselves will be used for training, it's critical that all employees receive training on how to use them, how to make sure they fit properly and how to interact with them. Training can be as quick as 15 minutes per user. Wearable computers are intuitive by design, but training can prevent missteps, give users a jumpstart and provide an opportunity for employees that need additional assistance to reach out.

4. Design and conduct a training pilot program with a small, manageable group.
   Once users are trained, start testing your wearable computers in a defined setting with a limited number of users, a predetermined set of objectives and measurable KPIs. Identify one application, task, customer, use case or training element that the wearable computers can be tested on, and run your pilot for no more than three months. This effectively applies the scientific method to the pilot to ensure that you are gathering the information needed to report to executives.

   One option is to have an expert use wearable computers to certify an apprentice or new employee on the job. Once the program is complete, evaluate its success and any takeaways for a wider rollout. When developing your reports on the pilot, each one should include name of the wearable computer, number of users, relevant user feedback, time saved with video, safety and compliance considerations, timeframe, problems solved, cost of problem, challenges, projected benefits and opportunities, ROI, security considerations, stakeholders or business units engaged and immediate next steps.

5. Focus on planning and project management.
   Industrial companies that dedicate more planning and project management resources to their wearable computer training programs achieve greater productivity and safety benefits at a faster rate. No matter your training goals, taking time during the pilot and throughout your program to focus on management is essential to meeting them.

6. Identify employee evangelists.
   Employee buy-in is essential to expanding your wearable computer training program. This technology represents a substantial change in how many older workers operate. Their participation is often key to creating training content in a cost-effective manner. However, a top-down approach makes it difficult to garner their support, account for their needs, incorporate their feedback and permanently change the way that they work. Instead, you want to take all users on a journey that transforms how they train younger staff or go through training. If you've had a successful pilot, use the initial participants' feedback to showcase the value of the program as you deploy more broadly.

7. Deploy to a larger group.
   Once you've completed your pilot, it's time to roll out to a larger group – but not yet to your entire organization. At this stage, you'll need to work with IT to identify and mitigate any potential security issues. Next, identify a group that will use the devices day in and day out and then conduct full-scale training with the device and how it will be used in the field. Stick to a single application or use case, and add more one at a time as you overcome any challenges.

8. Scale up your program.
   Build upon your initial deployment and expand the number of employees and programs that use wearable computers for training. Continue growing your digital training content database and increasing the effectiveness of your training program.

9. Communicate internally through video.
   Every step of the way, communication regarding your new video training program should be a priority across the organization. Whenever possible, use videos to communicate about the program to practice the methods you're instilling in your organization. This works especially well when trying to scale your message. Partner with your internal communications and HR departments to get the word out effectively. Post all training programs on your company intranet, and showcase the program through internal newsletters set up for dispersing information and accelerating knowledge transfer.

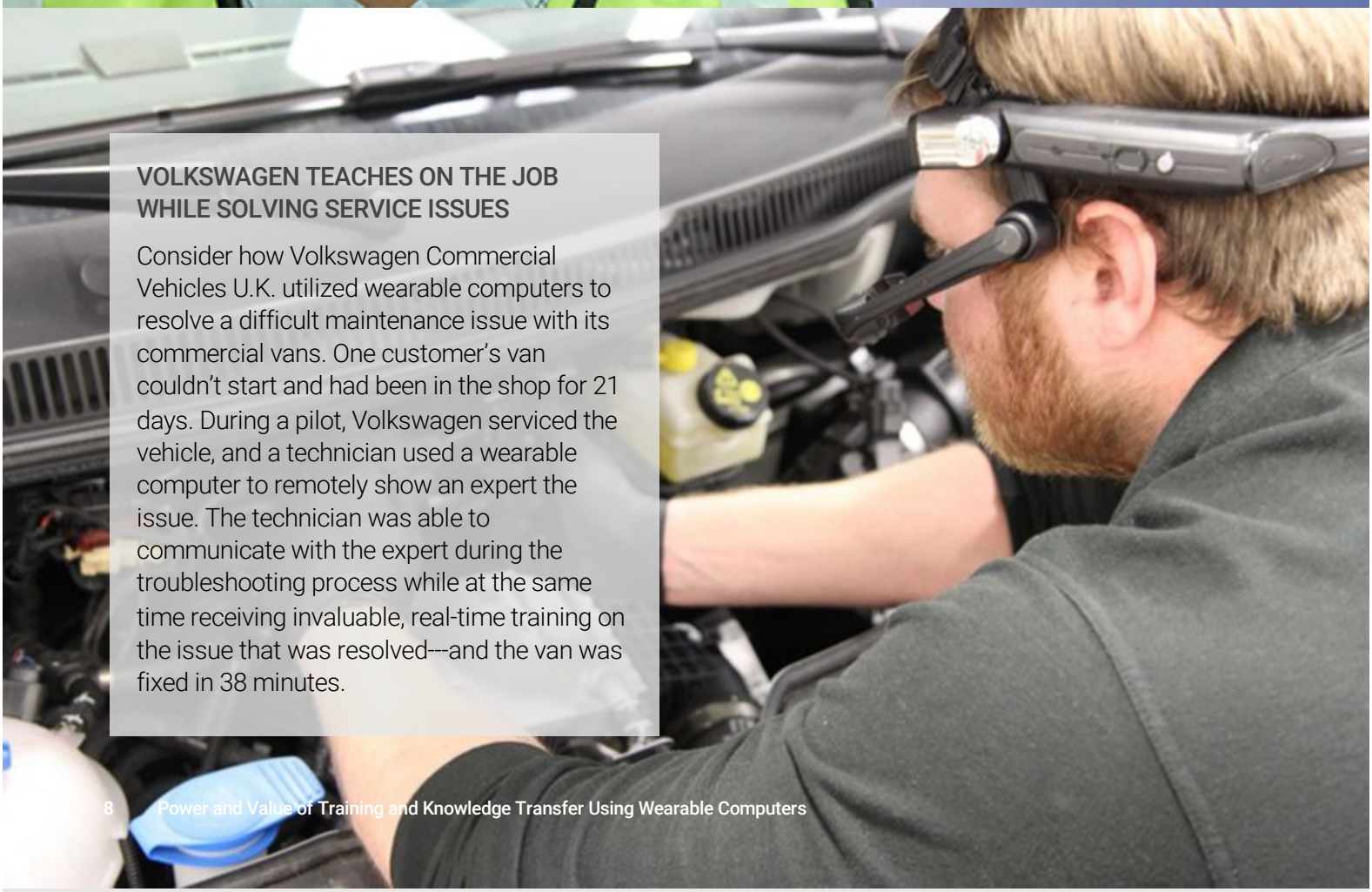
Empower your training department to overcome the skills gap

In an industrial environment, on-the-job training is critical to ensure that employees can share their expertise with each other and that companies can maintain the workforce needed to power their business models. Physical manuals and classroom-based training are no longer an effective way to train up the younger generation, and companies must adapt in order to close the skills gap. Those who leverage hands-free wearable computers that enable AR and video training will overcome the myriad forces contributing to the shortage of trained workers and secure the long-term benefits of a well-trained work force.

HONEYWELL USES WEARABLE COMPUTERS FOR FIELD TRAINING

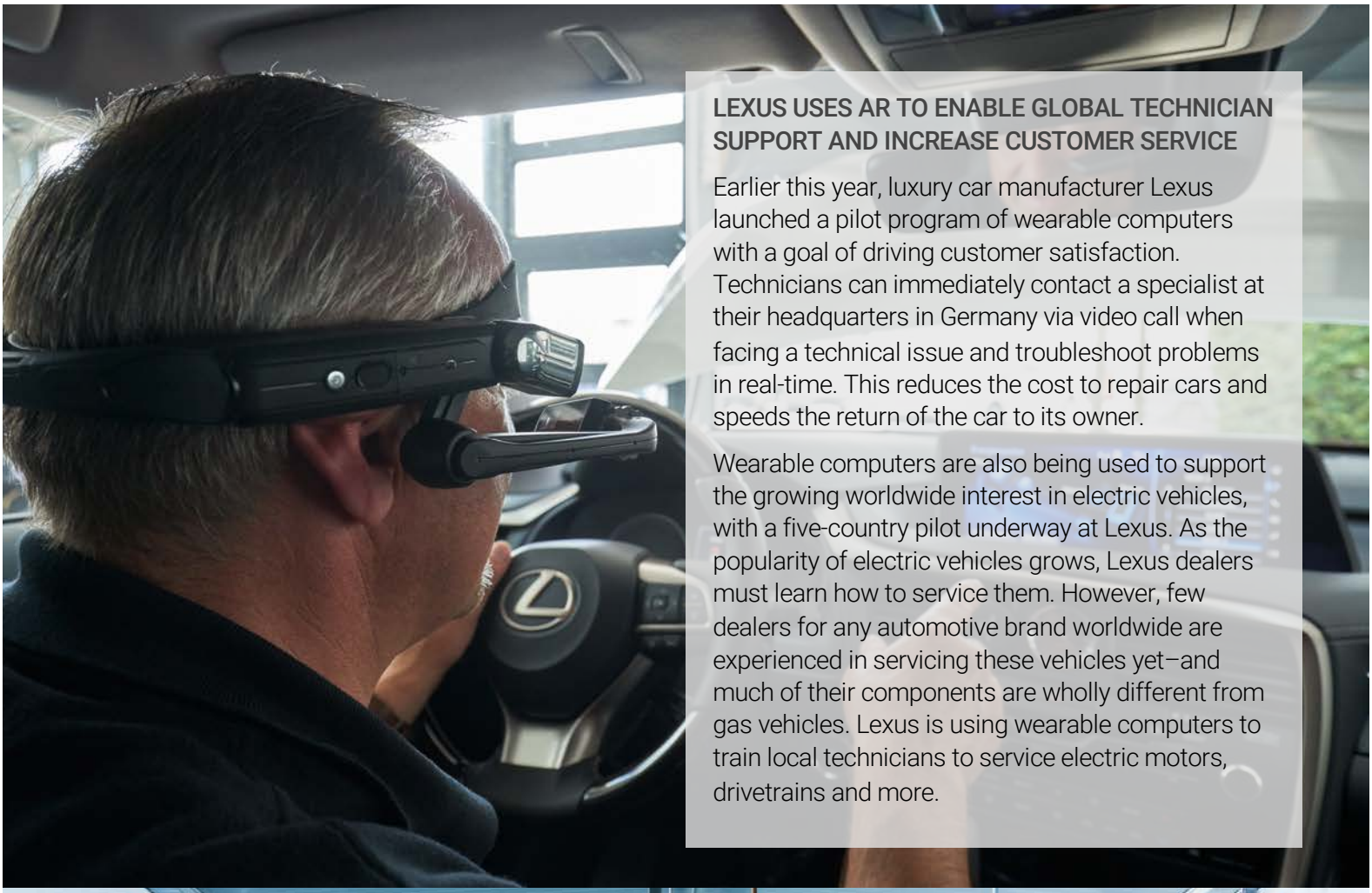
Aerospace and automotive manufacturer Honeywell helps industrial companies realize on-the-job training with wearable computers through its Connected Plant suite of products. As one aspect of the technology, workers use wearable computers to access data, procedures, health and safety information and to facilitate connections between field workers and remote specialists share expertise in real-time. One of its key uses is for guided work instruction and visualization of documents while workers are on a jobsite.

"This new Honeywell Connected Plant technology offers industrial workers the information they need when they need it, wherever they are," said Youssef Mestari, program director, Honeywell Connected Plant. "That means workers carry with them decades of relevant expertise that is accessible at any time by simple voice activation."[7]



VOLKSWAGEN TEACHES ON THE JOB WHILE SOLVING SERVICE ISSUES

Consider how Volkswagen Commercial Vehicles U.K. utilized wearable computers to resolve a difficult maintenance issue with its commercial vans. One customer's van couldn't start and had been in the shop for 21 days. During a pilot, Volkswagen serviced the vehicle, and a technician used a wearable computer to remotely show an expert the issue. The technician was able to communicate with the expert during the troubleshooting process while at the same time receiving invaluable, real-time training on the issue that was resolved---and the van was fixed in 38 minutes.



LEXUS USES AR TO ENABLE GLOBAL TECHNICIAN SUPPORT AND INCREASE CUSTOMER SERVICE

Earlier this year, luxury car manufacturer Lexus launched a pilot program of wearable computers with a goal of driving customer satisfaction. Technicians can immediately contact a specialist at their headquarters in Germany via video call when facing a technical issue and troubleshoot problems in real-time. This reduces the cost to repair cars and speeds the return of the car to its owner.

Wearable computers are also being used to support the growing worldwide interest in electric vehicles, with a five-country pilot underway at Lexus. As the popularity of electric vehicles grows, Lexus dealers must learn how to service them. However, few dealers for any automotive brand worldwide are experienced in servicing these vehicles yet—and much of their components are wholly different from gas vehicles. Lexus is using wearable computers to train local technicians to service electric motors, drivetrains and more.

MAJOR ORAL HYGIENE BRAND TROUBLESHOOTS MACHINERY WITH WEARABLE COMPUTERS

In high-volume manufacturing, every minute of downtime has a real cost. One global company can produce 400 tubes of toothpaste per minute at its factory, so every minute the machine is down costs $800 – or about $48,000 per hour. Readjustments and replacements need to occur to ensure product quality but even well-trained technicians aren't always able to swiftly solve every problem. With a wearable computer, technicians can make video calls to consult with another expert, show them what's in their field of vision and rapidly fix any issues that occur.

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