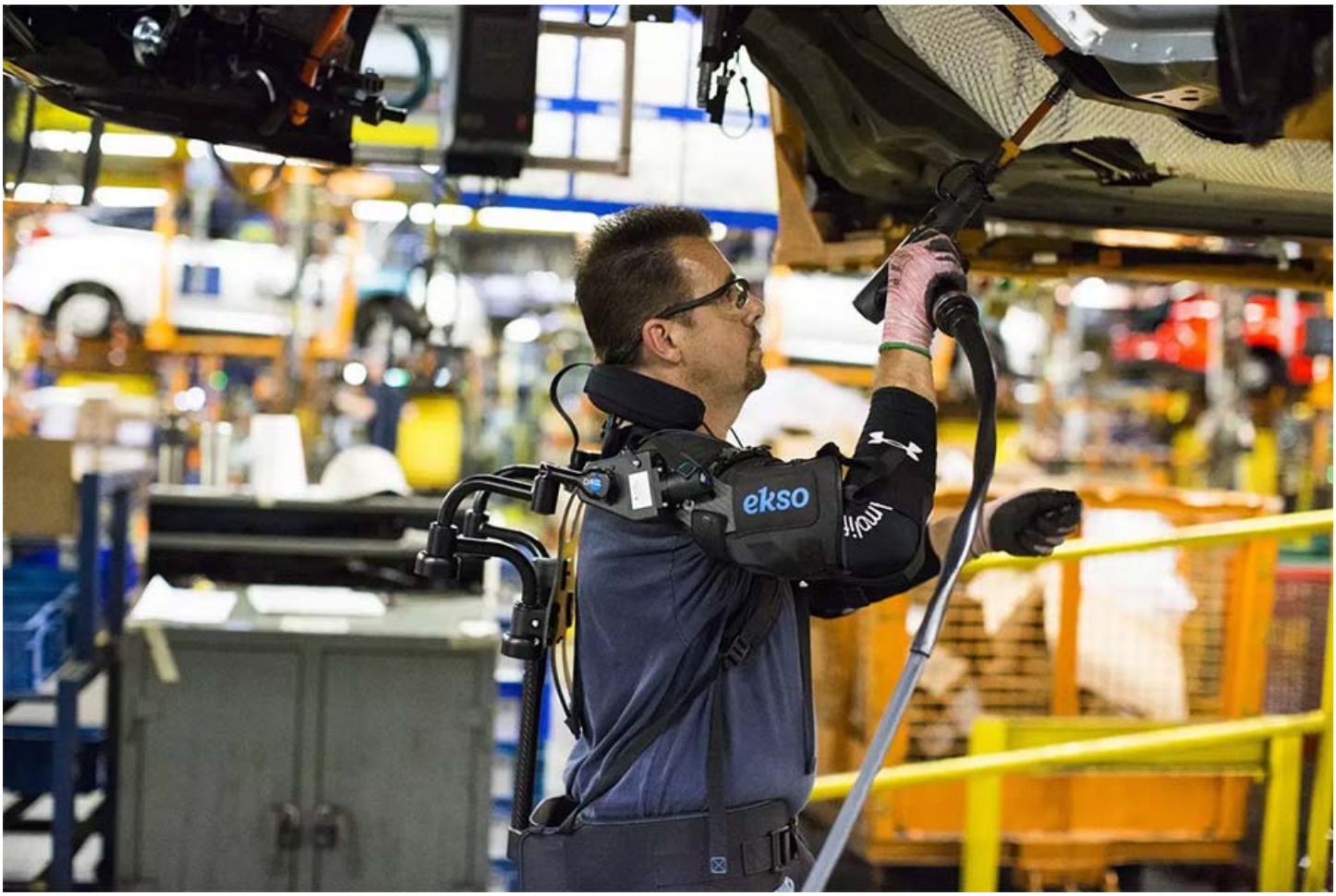
Robotics likely to assist but not replace technicians

In the fifth in a series of seven articles sponsored by Chevron, reporter Jacob Stoller looks at how technicians of the future might benefit from wearable tech and robotics geared toward ergonomics and safety.



By Jacob Stoller

Robots have stoked the human imagination since the days of the Model T, but it's only in recent years that corporate executives have begun to seriously contemplate replacing their human workforces with legions of intelligent machines.

There's certainly an appeal to relying on workers that never get tired, never take sick days, and

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never complain.

Industrial robotics, however, are moving forward in a very different direction – instead of robots that replace workers, vendors are creating robotic devices that make the work easier and less stressful so that workers don't get tired and injured.

Even the most sophisticated artificial intelligence (AI)-equipped robots are following this approach.

"At IBM, we view AI truly as an augmentation to the human worker," says Michael Martin, the national IoT (internet of things) executive for IBM Canada. "We don't see it as a total replacement of workers. That's a big myth."

A key area for such development is a branch of robotics called exoskeletons, which enhance the physical capabilities of the human body. At the high end, we see the "Star Wars-style" powered full-body exoskeletons, which give their wearers the semblance of super-human strength. These devices are showing promise in some areas of manufacturing, they are currently awkward and expensive, and unlikely to show up in an auto-shop anytime soon.

A more likely fit, so to speak, is the so-called bionic vest – a device designed to relieve the stress of repetitive motion, and of working overhead for extended periods of time.

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"I know first hand from spending summers working in my neighborhood auto shop that this is very physically demanding work," says Zach Haas, senior product manager for Richmond, Calif.-based robotics manufacturer Ekso Bionics. "Even something as straightforward as an oil change requires a lot of overhead work, from loosening the drain plug in an oil pan to replacing an oil filter."

Ekso markets a product called the EksoVest which is designed to alleviate this type of strain.

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“Because the human shoulder isn’t optimized for these types of overhead tasks,” says Haas, “it doesn’t take long before a technician will begin to feel that all-too familiar soreness across their shoulders and back from working overhead.”

The device uses passive technology to support the weight of the arms when held overhead. “When the arms are raised, the spring support from the EksoVest kicks in and provides gentle support under the upper arms,” explains Haas. “This effectively creates an invisible shelf where the technician can rest his/her arms while completing the task. The support gently recedes as the arms are lowered back down into the resting position.”

A similar device, the Paexo Shoulder manufactured by German manufacturer Ottobock, was piloted last year at Volkswagen’s Bratislava, Slovakia plant. It weighs 1.9 kilograms, is adjustable for the individual user, and has a short learning curve – the manufacturer reports that by the second day of use, workers forget that they are wearing it.

The device received strongly positive reviews from pilot participants, Volkswagen reports. “Positive, definitely positive,” says Andrej Hodal, a worker at Volkswagen’s Bratislava, Slovakia plant. “During the first days of testing, I could already feel my shoulders getting less weary, and my back doesn’t hurt as much after completing the given operations.”

The device might help alleviate a lost productivity problem that auto shop owners have just accepted as part of the landscape. “I’ve got so many guys with bad backs,” says Steve Bernard, owner at Auto Service Kingston in Kingston, Ont. “Usually 25% of my team has a weak back, or has a recurring issue, or carpal tunnel, or some kind of forearm or wrist or elbow thing.”

Another promising area would be to extend the working careers of technicians with many years of experience. “I have a semi-retired technician working for me,” says Garth Hansen, owner at Walnut Grove Auto Tech in Langley, B.C., “and sometimes I feel I work him too much. I know that by the end of the day, he’s super tired.”

A concern raised by one shop owner is that vests would likely be restrictive, getting in the way of the freedom of movement that technicians require. According to Haas, EksoVest is designed to allow almost a complete range of motion, but to also restrict unsafe practices.

“The few areas where a person’s range of motion (ROM) might be slightly restricted (such as reaching directly behind you) are the result of intentional decision in our design,” says Haas. “ In addition to the overhead lifting assistance the EksoVest provides, it also promotes proper posture and lifting techniques by encouraging technicians to lift with their legs rather than

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bending at the waist and to square off facing an object before lifting it."

Bionic vests are just the beginning of a trend that is likely to explode as use cases in manufacturing, construction, mining and healthcare provide huge potential markets for equipment vendors. In construction, or example, we are already seeing lift-assist devices that support a worker repeatedly lifting concrete blocks. In an auto shop, such technology might be applied to lifting tires.

"We will start to see exoskeletons that assist other parts of the body and for a wide variety of tasks," says Haas. "Like any new technology, over time exoskeletons will become more affordable and therefore more accessible to different people, including the everyday consumer who just wants some relief when they're painting their house or doing yard work."

Jacob Stoller is a freelance writer living in Toronto. He specializes in technology and lean management.

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