Maintenance, the IIoT and the fast changing workplace

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COMMENT

We have a garden cottage on our property that we used to let to long-term tenants. When our last guest gave notice a few years ago, though, we decided to 'zhoosh' the property up and give it a try on Airbnb. It has been an enjoyable adventure. The app 'pings' regularly, with guests from all corners of the world making enquiries, telling us about themselves and the adventures they are planning in our country.

Many guests are overseas post-graduate students visiting our universities, or NGO project workers needing to be in South Africa for a few weeks. Several, however, are people who simply like to travel and can work from anywhere: a Java programmer and website developer from Malaysia; an American English language teacher using an online App to connect to Chinese children; and an editor and translator from Sweden.

These people need only access to good Wifi to enable them to continue to earn. They don't have jobs, cars or housing back home. They see no need – there are Apps for these.

The Internet, Wifi, computers, tablets and cellphones and the Apps that run on our devices make people available online from anywhere in the world for the delivery and ordering of services. A guest in South Africa connects to a local Uber driver using exactly the same App and procedure as he or she would in their home country – and the Uber driver uses the same App too. How long before plumbing services are ordered and delivered this way?

The Internet of Things is taking this connectivity one step further. Internet connectivity already enables a phone to be used to remotely open garage doors, or to look at live video footage following a security alert. In industry, the Industrial Internet of Things (IIoT) is fast connecting the machines of production to the Internet. So not only can we 'talk to' our Uber driver, but the Uber can be remotely 'driven'.

Autonomous haul trucks on a mine in Western Australia are already being controlled from an air-conditioned office in Perth. And it need not stop there. Is the time coming when a haul truck driver may work out of an Airbnb in Melville, South Africa?

As well as the changing nature of the traditional workplace, the jobs we do and the skills we need to do them are changing, and will continue to change, at an accelerating rate.

From a proactive maintenance perspective, for example, condition-based monitoring in order to better plan necessary and scheduled maintenance on critical assets has long been practised. A maintenance professional would typically set out into a plant with a data logger, analyser and some sensors – vibration, temperature, ultrasound, etc – and, using a route map from one machine to the next, would log the condition of each asset for later analysis in the maintenance office.

By embedding Internet-connected sensors into each piece of equipment – which is no longer extraordinarily expensive – the data needed to ascertain the condition of each asset can now be automatically collected and uploaded. There is no longer a need for a human being to go to the asset to collect the data.

The IIoT also now features automatic data analysis, which enables 'live' results and alerts to be generated and delivered to anyone, anywhere. So the maintenance manager may also be able to work remotely out of an Airbnb?

Taking remedial action when an alert is generated will surely still need someone to physically attend to the problem. But this task can also be significantly simplified because of the IIoT and the connectedness of machines.

First, because of the vast amounts of data collected from similar machines operating in applications and environments across the world, artificial intelligence techniques can be applied to accurately predict what the problem is, when the machine or component is likely to fail, exactly when it can be/needs to be repaired, exactly what tools and spares will be needed and how the technicians can complete the repair in the fastest possible time once they arrive onsite.

Second, augmented reality (AR) can also be made available to maintenance technicians to make available a directly relevant step-by-step repair procedure. Detailed disassembly and reassembly steps along with associated checks can be superimposed onto the equipment being overhauled. Remote advice from other machine specialists is also directly available should the AI maintenance prediction fall short.

The IIoT is not only changing where we work, but also the very nature of the work we do. A new skill-set is required, which does not necessarily involve higher-level skills, but will almost certainly require more flexibility and high comfort levels with the IT/ICT skills on which the technology depends.

Fortunately, many of these skills, along with associated flexible work and lifestyle changes have already been enthusiastically embraced by the millennial generation. ❑