

Manufacturing SMEs and the IIoT

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Up to 90 per cent of manufacturers in Australia have 20 or less employees, according to Dematec Automation's CEO David Hart. He believes that small to medium business enterprises (SMEs) can gain a whole range of benefits from digitisation via the Industrial Internet of Things (IIoT) that they might not have thought of in the past.

Speaking at the Industrial Internet 4.0 Conference in Sydney, Hart said there were several avenues whereby a SME could invest in the Industrial Internet of Things (IIoT) to the benefit of the company.

"There will be the internal aspects that revolve around things like productivity, quality and compliance," he said. "Then there are the opportunities to look at external benefits – an opportunity to get some leverage around that pre-production and post production elements of manufacturing. It can be things like design and R&D at pre-production stage and bundling your services at the post production. It could be ongoing services and support and things like that. We all know that pure production activity is being squeezed by global competition so there is less value to be derived from that aspect of manufacturing. However, technical enhancement of production systems can lead to potential new revenue models."

In terms of how the IIoT can support those initiatives, Hart said connectivity is a big thing. That might be connectivity between different systems within a business; it might be connectivity between pieces of equipment or machinery of a business; it might be connectivity to remote assets or systems that a company operates.

This connectivity can deliver things like real-time visibility of system performance or production performance. It might be able to give notifications of how a system and production cycle is running so staff don't have to watch or monitor everything all the time because it will report an issue.

"Maybe there is substantial data you can analyse onsite and there must be potential benefits where you can make improvements," said Hart. "Maybe you can derive automated reports from it, which could be a significant labour saving. There might be the capability to integrate that data across

multiple platforms. You might integrate your production data with your enterprise resource planning (ERP). One of the big things about the IIoT, which hasn't always been the case with such systems, is the flexibility and scalability."

It is the scalability that makes it important that SMEs don't put the IIoT into the too-hard or too-expensive basket. A small business can start with something small, relatively cost-effective, improve the concept and then grow from there. An important consideration, according to Hart, is for SMEs to have the opportunity for visual management and to create dashboards that bring the right information to relevant people in real time. This will allow the company to have real-time visibility within its production systems and assets that can lead to the opportunity to continuous improvements.

"If you are bringing in consistent data from your assets or your machines, you have the opportunity to develop a performance base line," said Hart. "Then you can look at how you can improve that performance and you've got a yardstick from which you can measure it. You have consistent data and not anecdotal pieces of paper that may or may not give an impression of consistency. That process of production data can also feed into preventative or predictive maintenance issues as well. By collecting that performance data over time, you can identify issues that might mean that you can save money on undertaking excessive maintenance, or you can save downtime by more informed and targeted preventative maintenance on your equipment."

The information being collected can be automatically compiled, collated and presented into reports or dashboards for the management teams and production supervision team. That can be a labour saver but it can also save on data transcription errors and typos. Those other things can typically create headaches around that sort of information, especially in a small-to-medium-sized businesses.

"Granularity that you can get from having sensors on your equipment are assets feeding back into activity-based cluster systems that can be beneficial and give you real information about what it actually costs you to produce something," said Hart. "This includes different products or produce on different lines and shift to shift – what are the differences you get in performance from day shift to afternoon shift? This is the type of information you can get."

In terms of external operations, by embedding IIoT capability into remote systems or assets, it creates an opportunity for an Original Equipment Manufacturer (OEM) to get value for their clients and for their business, claimed Hart. They might be able to use connectivity to offer things like promoting system operational support and upgrades. It might be part of a service package that a company can onsell to its clients and can feed into an extended warranty.

That same operational information that has historical data, with systems operating in different operating conditions with different clients, can feed back into preventative or predictive maintenance systems. It can also feed back into the design process so a company can better understand how its equipment operates over time in a variety of conditions. The SME can bring that back into its design process, which will enhance the company's future offerings.

"You can then take that a step further with connectivity, visibility with what is happening with systems and assets in the field," said Hart. "You might choose to change the revenue models by which you engage with clients. Instead of just selling a machine outright you might start to lease the machine and charge on performance. It is almost equipment as a service as opposed to software as a service."

Hart also highlighted that if SMEs in the engineering and manufacturing industries decide to modify, there are a range of benefits.

"You'd start by leveraging cloud computing," he said. "You might use Wifi or cellular connections rather than hardwiring to each machine. You might have smart sensors with on-board communications facilities, or you might choose to retrofit sensors to equipment. All of this essentially means that it lowers the barrier to entry of the initial cost of investment to get going with digitisation. So you can start with something relatively small and build it up as your business needs evolve or change."

Hart warned that if a SME does decide to take the plunge, research is needed and a company has to make sure they are not under or over utilising the technology that is available to them. This is because every piece of technology has a purpose, which is usually providing information and this mean it is important to take advantage of the results.

“The first thing a business needs when heading down this path are outcomes in mind,” he said. “A willingness to implement change and continuous improvement and do something with the information that they are going to get. Because that will change. If they are not prepared to do anything with the information, then all the sensors are nothing more than pretty toys.”

SMEs might want to start with something relatively basic and small, such as a retrofit into existing infrastructure or equipment. Maybe some smart sensors going onto some machinery that will enable the SME to establish a performance baseline. From that baseline the company should be able to find some opportunities for continuous improvement and implement that change and monitor the outcome of that change. Chances are they will get a return on investment on that initial installation.

“Over time, as you get used to working with the system, and you are collecting more data, you can continue to analyse it for more valuable insights and that might allow you to further optimise your production processes,” said Hart. “Implement things like predictive maintenance, enhance your design, optimise the way you operate etcetera. You might be able to take that data and integrate throughout your business – for instance, integration into ERP systems or quality systems and databases. From there you might be able to identify some additional opportunities to build on that system. That might be wider deployment of sensors in that system within the business. It might be looking at using the IIoT for energy management within your business. It’s not a static thing – you don’t put the system in and forget it, you work with it as your business needs to evolve and adapt.”

Hart said he sees the IIoT as a great enabler for manufacturing SMEs to leverage the productivity, quality and performance benefits that automation and digitisation can bring. The cost of getting started is as low as it has ever been, he said. It is worth taking the plunge and starting to explore the benefits it can bring to a business by doing something with the technology.