

Assessing Machine Shops' IoT Risks and Rewards



Interview: Terri Hiskey

**Vice President, Product Marketing
Epicor Software**

As vice president of global product marketing, Terri is responsible for developing and delivering successful go-to-market activities for the Epicor manufacturing portfolio, including strategy and development of differentiating market positions. Her knowledge of the manufacturing sector is broad, with a focus on the use of technology in industrial businesses. Before joining Epicor, Terri worked for Oracle on its Supply Chain Management Cloud portfolio, and before that, she worked for Agile Software Corporation—gaining experience with manufacturing supply chain management, planning, order management, logistics, and product life cycle management.

As the manufacturing industry continues to advance, our tools are getting smarter. Machines, systems, and computers are all communicating with each other through what is known as the Internet of Things (IoT). This network of systems, databases, and objects is having such an effect on the manufacturing world that it's being heralded as our fourth industrial revolution—or Industry 4.0.

The capabilities that are available through the IoT-enabled technologies are changing the way businesses process information, deploy resources, and execute strategy. Manufacturers of all sizes—including small and midsize machine shops—must take steps to understand and adjust to its effect on their business.

There are obvious opportunities to be gained, but there are also potential risks. With all this in mind, it can be difficult for machine shops to know how to engage with IoT technologies.

Many of the most critical IoT processes draw on functions already established by enterprise resource planning (ERP) and manufacturing execution system (MES) technologies. To that end, Terri Hiskey, Vice President of Product Marketing, Manufacturing Portfolio at Epicor Software shares how to get more out of your ERP and MES solutions by leveraging IoT.

What is the primary benefit for a machine shop that deploys IoT functionality? Is it performance improvement or competitive advantage?

Terri Hiskey: I think the answer to this is both. Machine shops that adopt IoT technology can expect productivity improvements in instances where manual processes can currently be automated via sensors—such as tracking output or temperatures. This eliminates the need to have a person collect that information, and it also helps to prevent human errors that may be made in recording numbers and transferring them to a spreadsheet.

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Machine shops that are first to adopt IoT/Industry 4.0 technology will be better positioned against their competitors with automated processes, and they will have better visibility into their output and equipment, so they can understand earlier in the process if a machine needs servicing because it isn't producing as much output as usual.

This will enable machine shops to be more proactive about dealing with faulty equipment and will let them get ahead of servicing such equipment before having to shut down production lines.

How can machine shops or manufacturers get started collecting data via IoT in a standardized way?

Hiskey: The ability to connect manufacturing equipment to a web-based network and to derive substantial value from these connections is more practical and compelling than ever. Most machine tools communicate in standard Internet technology such as HTTP, TCP/IP, XML, and Ethernet that are inherently network friendly.

Well-developed standards such as MTConnect and OPC-UA facilitate the connection of machine tools and other manufacturing equipment to a data collection network and enable the interoperability required for plant-wide communication.

The smallest machine shop can get started with small applications such as sensors that report on temperatures or output connecting back to a central database so that trends can be analyzed over time. This is an area that companies can test the waters with small, targeted use cases—no need to boil the ocean.

How can machine shops maintain security over data collected via IoT?

Hiskey: Cyber threats to IoT-related processes are real and—according to security experts—are growing. Threats include theft of intellectual property, alterations to data, and disruptions of processes. Shops will need to consider how to protect their data, systems, and networks at every step.

Connecting machine tools to a network can create a number of vulnerabilities, so companies will have to be sure to consider and build in security protocols to minimize these threats as they implement their Smart factory.

Is it necessary to invest in capital equipment or hardware to collect information via IoT, or can cloud technologies be leveraged?

Hiskey: While adopters of IoT technology will need a central repository in which to store the data that is collected, that repository doesn't need to physically reside at the machine shop. In fact, many companies are opting for remote storage of their data via the cloud.

This approach takes the responsibility of maintaining capital equipment like servers off the organization, and the capacity of the cloud to store and process data is virtually unlimited. Storing and processing data remotely is generally more economical, flexible, and secure than onsite alternatives. The cloud is also more scalable, and its capacity can be expanded to rapidly meet growing demand.

What are the software and network programming requirements for a machine shop adopting IoT capabilities?

Hiskey: Most machine tools communicate in standard protocols such as HTTP, TCP/IP, XML, and Ethernet, so nothing too out of the ordinary. A bigger thing to consider is the type of data that should be collected.

One of the advantages of data collected via IoT is that it enables better decision making. When devices are connected, the data they generate can flow into software applications that create the information individuals need to make choices that are timely and effective. Decisions can then be made on knowledge and facts—not guesswork.

Better decisions mean fewer mistakes and less waste. Details to consider and determine when setting up IoT processes include what data should we collect, who should receive this data, how will the information be used, and how will this support decision making.

What are the personnel and training requirements for a machine shop adopting IoT?

Hiskey: As much as IoT enables the automation of processes, there is no doubt that human beings will still play a large, engaging role at manufacturers. In fact, the human role will grow in importance and influence.

IoT will enable the collection, analysis, and management of data for devices and sensors throughout the manufacturing operation, but the most important sources and consumers of this data are people—including operators, programmers, maintenance engineers, production supervisors, and front-office business managers.

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What are the common or typical risks or mistakes faced by a machine shop adopting an IoT strategy?

Hiskey: One of the biggest risks is IT security. Another risk—or potential mistake—is not defining specifically what data is the most helpful to a particular project—or not determining a way to analyze the data that is being collected. These things should be considered from the start in order to have an effective IoT strategy.

Do you recommend preliminary or incremental goals for a machine shop working to adopt Internet of Things functionality?

Hiskey: Yes. IoT projects can be implemented as small projects to start—including simple sensors collecting basic data that can be collected, aggregated, and analyzed easily. As the understanding of IoT grows, the projects can expand to become more complex.

Conclusion

There is no denying the big potential for disruption to small and midsize enterprises that Industry 4.0 represents. However, the growth opportunities are on a scale with that potential—and the evolution to a new way of doing business is underway.

Machine shops should recognize these developments and learn what the new technology is informing them about their customers, markets, and businesses. Top-performing ERP and MES systems include built-in features that support IoT and Industry 4.0, so these will be valuable tools as you continue on your growth journey.

Visit epicor.com to learn about Epicor ERP and the important role it can play in adopting a sound Industry 4.0 strategy for your machine shop.

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Contact us today  info@epicor.com  www.epicor.com

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