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Increase Manufacturing Revenues and Reduce Costs Through the Industrial Internet of Things

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Not long ago, a family-owned manufacturer here in Northeast Ohio made a fateful decision that fundamentally impacted how it conducted business, and likely altered its trajectory years to come.

The company faced an ongoing struggle with meeting on-time delivery requirements for its customers. The problem was traceable to multiple factors within its shop floor environment—production delays would occur; some jobs would run on time, while others wouldn't, and no one seemed to know precisely why, or how it could impact shipping and delivery.

In response, they set up intelligent and connected technology on specific shop floor machines. This technology collects relevant data from each machine and sends it to a data base for further analysis by management to help inform decision-making.

As a result, the business boosted shop floor performance by 20 percent and has taken an important step toward ensuring on-time delivery for its customers. That by itself is invaluable. But the real magic: All this technology cost less than \$10,000 to purchase and deploy.

If your business finds it challenging to consistently meet on-time delivery requirements, you're not alone. This is a persistent challenge for businesses of all sizes and scopes. And while the factors that drive this challenge may be unique to your business, many practical solutions are based on technology that's rooted in the internet of things (IoT).

By now, you've probably heard of IoT, which, by definition, is a network of devices that contains electronics and connects to the internet, thus allowing such devices to themselves connect, interact and exchange data. Within the manufacturing realm, IoT is referred to as Industrial IoT, or IIoT.

A few short years ago, IIoT was little more than a far-off concept for most manufacturing businesses...a "someday" technology that would merit consideration in due time. Well, that time has arrived. Today, IIoT provides a competitive advantage by allowing manufacturing businesses to save time and money in ways previously unfathomable. Today, more than 26 billion devices are connected to the internet and entwined in the IoT fabric. By 2025, that number is expected to jump to 75 billion. Northeast Ohio manufacturing businesses stand to gain as well; a recent McKinsey study commissioned by the regional development organization Team NEO predicts that by 2025, Northeast Ohio has the potential to receive an additional economic impact of up to \$4 billion-\$13 billion annually through implementation of IIoT in various manufacturing segments.

IIoT is centered on solving business issues (e.g., operational efficiency, labor and machine utilization, preventive maintenance, workforce safety) through technology. Essentially, it's a blend of operational technology (OT) and data analytics—all driven by human experience and intelligence. For manufacturing businesses, the process is fairly straightforward: Electronic devices within a business – from shop floor machines to thermostats, humidity sensors, volatile gas sensors and more – are programmed to sense something—be it vibrations, power fluctuations, environmental factors and more. They then collect data on the issue and send it to a database, where it can be analyzed by data analysts, data scientists and consultants. At that point, a business case is made, and a business plan is designed to create tangible business value.

In a broader sense, how can data from connected devices help your manufacturing business increase revenues and reduce costs? There are four areas in particular to consider:

- **Operations optimization:** Manufacturers are constantly challenged to maximize the efficiency of their labor pool and machinery and therefore, produce more product with minimal or no increase in cost. Are you using your labor and machinery to their highest potential? IIoT can generate insights to help your staff work to their highest capabilities. There are traditional ways to pursue this, but a key is gaining insight about all the important parts of your business, then using that insight to drive intelligent decision-making. IIoT is central to that effort.
- **Predictive maintenance:** Any manufacturing business should seek to minimize or eliminate machine downtime. Yet, machines need regular preventive maintenance, and sometimes, parts fail and things break down. The question then becomes how to fix machinery at a time that's convenient and profitable. IIoT technology can monitor equipment and detect when it is about to "break" and inform you, so that maintenance can be done at lower cost off hours.

Consider an example: Recently, a Northeast Ohio brewery/restaurant experienced persistent problems with system failures in its carbon dioxide, or CO₂, equipment. (Essentially, CO₂ gives beer its fizz.) When the equipment failed, beer production came to a sudden halt. To combat this, the company implemented sensing technology to detect when such failures could occur, so that repairs could then be scheduled after hours. This minimized downtime and disruption to restaurant operations while optimizing preventive maintenance.

There's more. The brewery also implanted GPS tracking chips into its beer kegs to prevent individual kegs from disappearing after they were sent to bars, restaurants and other customers. Those kegs in total represented a \$500,000 capital investment, so each lost keg was a financial loss—and the more kegs that didn't come back, the more those losses added up. The GPS chips, meanwhile, were a fraction of that cost—yet the benefit they provided was significant.

- **Inventory optimization:** Employing smart sensors throughout your operation gives you real-time insight on current raw material stocks, where those materials are on your shop floor at any time and how quantities correlate to current and potential orders. This, in turn, enables you to plan intelligently and stock materials based on need, which saves money. It also increases labor efficiency as employees no longer need to search for "missing" inventory. Rather, they always know where the last shift put it.
- **Optimization of worker health and safety:** If a particular piece of machinery on your shop floor is vibrating, for example, a component of it could come loose and fly off, potentially hitting a worker and injuring or even killing them. However, if that machine is connected via IIoT, the vibration can be detected up front, and the problem can be proactively addressed. In doing so, you'll keep your workforce much safer, which is the most important benefit of all. Additionally, you'll avoid costly insurance and workers' compensation claims and maintain operational efficiency by eliminating the potential downtime for that machine.

For your business, IIoT really is about optimizing processes and performance to do more work with essentially the same resources, rather than doing the same work with fewer employees. In the end, the better your company performs, the more prosperous all its stakeholders will be.

Implementing IIoT is a four-step process:

- Identify the business problem to be solved.
- Identify the best vendor to resolve it.
- Implement the right technology.
- Track and monitor the benefits.

IIoT is nothing short of a revolutionary wave that's sweeping the manufacturing realm. To maintain competitiveness in an increasingly global marketplace, your business has everything to gain by integrating IIoT technologies, starting today—and potentially much to lose by standing pat.

Do you have questions about IIoT, or other business advisory issues? Please contact **David Mustin, MBA**, at 440-605-7222, [email David](#), contact Jon Shoop, CPA, at 440-449-6800, or [email Jon](#).