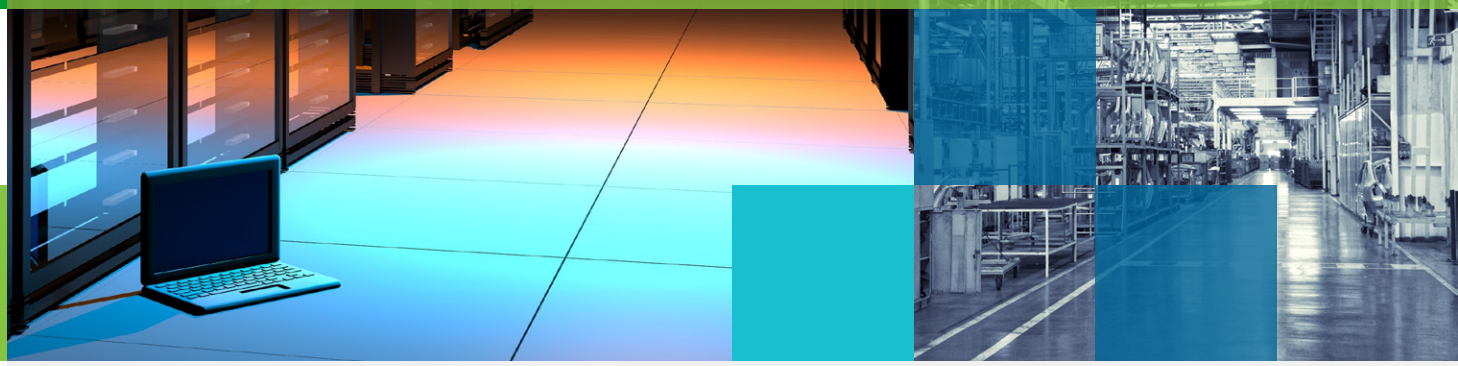
SYSPRO™
Simplifying your Success

REIMAGINING MANUFACTURING WITH THE INDUSTRIAL INTERNET OF THINGS (IIoT): WHY MANUFACTURERS NEED TO CONNECT THE SHOP FLOOR TO THE "TOP FLOOR" FOR A COMPETITIVE ADVANTAGE

info@ca.syspro.com | 1 (888) 259-6666 | www.syspro.com/ca

SYSPRO™
Simplifying your Success

SUMMARY



The Industrial Internet of Things (known as IIoT) is the next wave of innovation impacting the way the world connects and optimizes machines. It covers all aspects of a manufacturing business—blurring traditional boundaries between plant operations, supply chain, product and demand management. The IIoT is ushering in a new era of vastly improved productivity in the world of supply chain and production process, and can provide manufacturers with a distinct competitive advantage.

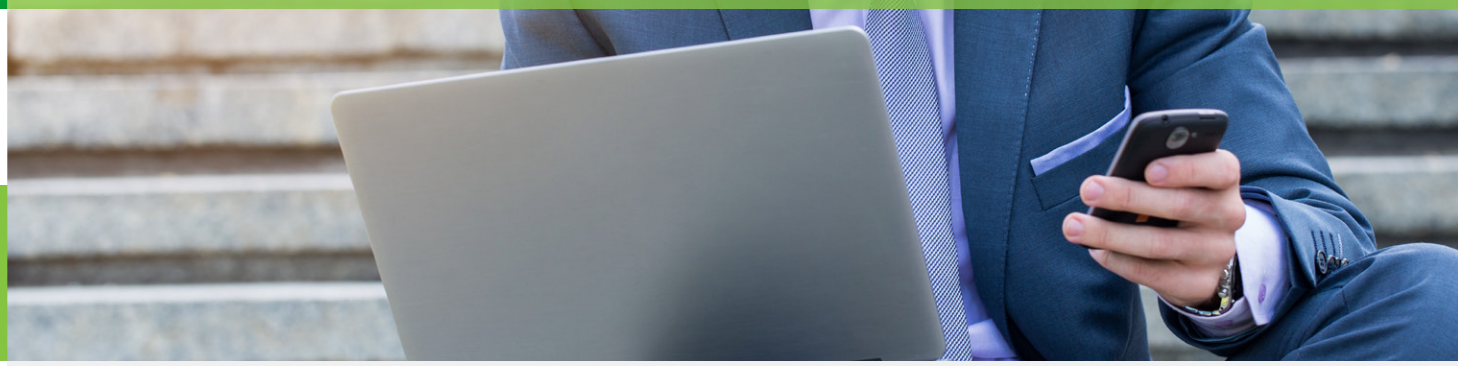
Accenture estimates that the IIoT could add more than $10 trillion to the global economy by 2030. That number could be even higher if companies were to take bolder actions and make greater investments in innovation and technology than they are doing today.

This eBook provides an overview of how the Industrial Internet of Things (IIoT) helps manufactures gain valuable insight and actionable data into business performance from the shop floor right up the "top floor". It is divided into three key sections:

- A brief description of the Internet of Things (IoT)
- Key benefits and drivers of leveraging IIoT principles to connect the shop floor to the "top floor"
- Best practices for developing a sound IIoT strategy in manufacturing businesses

SYSPRO™
Simplifying your Success

THE INTERNET OF THINGS (IoT)



Defining the Internet of Things (IoT)

The Internet of Things or IoT was coined in 1999; however, the concept of IoT has much deeper roots, with its origins dating back to the early 1980's.

So what is it?

Different people have different ideas as to what exactly IoT represents, but the general concept of IoT is that with the progression of technology and internet connectivity, devices, machines or objects that haven't traditionally been connected, can now become a network of intelligent or "smart" computers, devices and objects that collect and share huge amounts of data.

The earliest example of an IoT application was in 1982, when a Coke machine, installed at Carnegie Mellon University, was able to report low inventory levels and whether the drinks in the machine were cold enough. Since then, there have been many examples of IoT in action. However, IoT has found its niche in the past few years with the advent of modern, consumer devices that were not traditionally connected to a network including televisions, refrigerators and other home devices, and cars.

SYSPRO™
Simplifying your Success

THE INTERNET OF THINGS (IoT)

There are two major pieces to the IoT puzzle that manufacturing leaders need to understand:

Intelligent Connectivity of Things

The main driver behind IoT is the enhancement to the way we do things. From a business standpoint, the idea of being able to uncover inefficiencies, and improve connectivity, efficiency, scalability, time savings, and cost savings for industrial organizations can be a huge competitive advantage. In a very practical sense, we haven't even begun to realize the full extent of what we can do with IoT—and its impact cannot be underestimated. IoT brings more insight and visibility to the way organizations do business today. It can also potentially and dramatically change the way manufacturers decide to go-to-market with new solutions.

Leading organizations recognize the opportunity they have to transform their businesses. This opportunity drives the need for the adoption of intelligent, connected devices and objects. Evidence suggests that many businesses are moving away from building widgets (where—over time—commoditization starts to bleed in), and instead, are moving towards a greater use of technology and digitization of business, in order to differentiate their products and solutions in the marketplace.

Convergence

Connecting devices and machinery in a "smart" fashion is not a new business concept—it's been done on the factory floor for more than 30 years. However, because there was no Internet or Wi-Fi to speak of, devices were siloed parts of the functional business that did not communicate with other departments. Nor were they communicating pertinent information seamlessly though technology, from the shop floor to the "top floor," where executives could use the data to make informed decisions about complete business performance—in real-time.

There has been an ongoing trend of convergence in information technology (IT) over the past 15 years. Because technology has emerged and adapted to changing needs, people can now consolidate data from multiple and disparate systems, into a single connected device.

SYSPRO™
Simplifying your Success

DIGITAL FACTORY SOLUTIONS

The same convergence trend is also represented in today's operational technology (OT)/manufacturing. As you gain increased visibility into all parts of your business through a common, converged infrastructure, you not only gain insight and information into what's really happening, but you can also start to leverage that infrastructure for business scenarios.

Convergence reduces the cost of building multiple, siloed networks running various, proprietary protocols. It merges your disparate solutions on a single converged IP infrastructure, which leads to improved business performance, including:

- **Improved flexibility on the factory floor**
- **Reduced downtime for machines and labor**
- **Greater safety and security measures**
- **Deeper visibility into the various parts of the value chain**
- **Enhanced operational efficiency**
- **Decreased risks and costs**

SYSPRO™
Simplifying your Success

DIGITAL FACTORY SOLUTIONS

Over the past 20 years, the division of technology spend between information technology (IT) and operational technology (OT) has been about an 80/20 rule.

Think about that. Businesses have traditionally spent 80 percent on the IT side and only 20 percent on the operational technology (OT) side. This breakdown does not make much sense because the operational side is the area of the business that actually generates revenue. Products and the delivery of services, the lifeblood of any manufacturing organization's financial health, have taken a back seat to technology adoption.

Recent studies suggest that everything is going to change over the next five years. The amount of spend on operational technology (OT) vs. IT will be reversed, and the core part of the business will be the key driver for technology adoption. Up to 80 percent of technology budgets will be in the core business and not IT. There is a growing recognition that investing in the core business and digitizing that part of the business is truly valuable for an organization's competitive advantage and bottom line.

As a manufacturing leader, what if you could:

- Reduce operational downtime?
- Bring new products to market faster?
- Achieve real-time visibility?
- Better manage the global supply chain?
- Protect your company from security threats?

SYSPRO™
Simplifying your Success

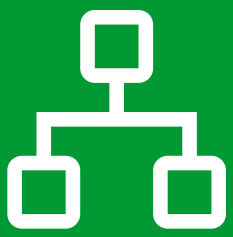
DIGITAL FACTORY SOLUTIONS

Cloud Technology, Machine-to-Machine Learning and Big Data all have obvious cost-savings and profitability business benefits for manufacturers. Incidentally, they are all directly linked to operational technology adoption, and business leaders are starting to recognize this fact. In a recent survey, 625 manufacturing executives were asked which technologies could most change how they manage production over the next three years. The top three responses were:

Cloud (37%)	Machine-to-machine (M2M)/IoT (33%)	Big Data analytics (32%)

The results are not surprising. These three technology pillars are most likely to improve business productivity.

Manufacturing executives should be involved in creating a blueprint and step-by-step guide to achieve business solutions that meet their needs.



Factory solutions will vary based on each manufacturing company, but common components of the digital factory should include:

- Connected assets
- Factory wireless
- Factory security
- Factory network
- Connected machines
- Factory collaboration

SYSPRO™
Simplifying your Success

DIGITAL FACTORY SOLUTIONS

The manufacturing journey—how do you get there?

The process of converting to a digital factory is not necessarily an overnight process. Organizations may be at different points in the technology adoption process, but let's assume that the traditional factory, with a collection of proprietary, siloed environments, is the most common starting point. There are three main phases after this that follow, and with each phase, the value increases.

Phase 1 Unmanaged, un-converged Ethernet	**Phase 2** Converged plant-wide network	**Phase 3** Flexible, multi-service platform
▪ Rich sensor data ▪ Siloed ▪ No security	▪ Converge siloed networks for IoT visibility and cost-savings	▪ Controls security ▪ Controls mobility ▪ Video and collaboration ▪ Remote monitoring ▪ Cloud ▪ Software defined factories

SYSPRO™
Simplifying your Success

DIGITAL FACTORY SOLUTIONS

Phase 3 is the obvious end goal. Having the ability to run all systems from a common infrastructure is where businesses begin to see real value from their OT investments.

So how do you achieve Phase 3?

From a factory connectivity perspective, three basic foundational blocks need to be established, in order to make the journey to Phase 3 possible:

Factory network

Factory wireless

Factory security

Each building block is a series of steps that can improve a plant's connectivity.

SYSPRO™
Simplifying your Success

DIGITAL MANUFACTURING: A HOLISTIC VIEW

The digitization of manufacturing promises to change the way businesses adopt technology. It will change the way production is managed in the factory through automation, wireless tooling and cyber security. Ultimately, it will dramatically transform the entire business. Digital manufacturing aims to:

- Increase the amount of insightful data moving "in and out" of the factory floor
- Improve supply chain performance—reduce "just-in-time" deliveries, and improve predictive deliveries of raw goods
- Enhance the quality and transmission of data to executive leaders—providing insightful data from factory floor for inputs, outputs and bottlenecks for more informed decision-making, in real-time.
- Transform the way manufacturers deal with their vendors—providing improved remote support and maintenance

SYSPRO™
Simplifying your Success

DIGITAL MANUFACTURING: A HOLISTIC VIEW

Where and how does this fit YOUR business?

When considering the three business areas of data, automation and security, the focus on the business side of the opportunity is where owners should begin to see ROI.

How does this all matter in the real world? Well, the real world is reacting to the changes we're seeing with the Internet of Things (IoT) in a big way.

The three main questions you should ask about any technology investment:

- What is the state of IoT in your industry?
- Which areas of the business can you take advantage of it?
- Which do you prioritize so that you see early returns?

The digital factory has the most focus on:

- Maintenance planning and prevention
- Connecting devices for efficiency
- Integrating production planning
- Understanding demand from the shop floor

The enterprise and business processes need to include:

- Sales
- Operations planning
- Executive directives

SYSPRO™
Simplifying your Success

DIGITAL MANUFACTURING: A HOLISTIC VIEW

The advent of inexpensive, "smart" devices in conjunction with ubiquitous Wi-Fi has created a vacuum of mobility—resulting in a significant industrial revolution. Large, lucrative enterprises have already begun to adopt this investment strategy in IIoT. It is equally advantageous for small to medium-sized businesses to invest in a strategy to adopt intelligent devices and processes as part of the IIoT revolution, to give them a competitive advantage.

Understanding the business processes that you are looking to improve is the fundamental step—allowing you to strategically take advantage of new technologies and selecting only those that matter. A study, published by Accenture, indicates that 84 percent of organizations believe they would benefit from enabling IIoT in a variety of ways, but only 7 percent have developed a strategy.

A Verizon study reveals that:

- IoT enables organizations to comply with regulations, increase process efficiency, gain better customer insight, and build new business models
- IoT platforms make the development of IoT applications easier, faster, and cheaper for stakeholders
- The next step for IoT is predictive and prescriptive analytics
- Convergence between different IoT solutions is addressing real-world problems for helping consumers in their day-to-day lives

SYSPRO™
Simplifying your Success

DIGITAL MANUFACTURING: A HOLISTIC VIEW

Business value is in business processes

All organizations adhere to a series of business processes. Today's businesses, for the most part, rely on some form of technology to enable either partial or total operations. These processes define not just how things are done, but how desired outcomes will be achieved. Processes also help to define an organization's success. The best businesses have great processes in place—that they rely on—even if they do not produce the highest caliber products.

Technology does matter. The 21st century is a dynamic and exciting time because technology has evolved everything forward, and it will continue to do so. Consideration should still be given to technology, as to what is needed and the best way to implement it the business.

When planning how technology can be integrated into your business processes, you should consider:

- Developing an overarching strategy to connect the entire enterprise into a long-term plan
- A strategic plan that addresses how to achieve this without making it a "just because we can" approach
- A plan to ask hard questions—what's the benefit to the business?
- A format to identify what information matters most in your business processes—what would make a difference, and where can the data be found or created?
- A priority list of things that will make a difference sooner, but know what the long-term direction should be

DIGITAL MANUFACTURING: A HOLISTIC VIEW

The future of IoT for manufacturers

Manufacturing owners and executives know what they produce, where the raw materials come from, who buys their products, and what kind of service they aspire to provide. Nobody is more qualified to understand your business than you are. However, in order to be able to ask yourself key questions about how to do things better using technology, you should first understand the business issues and opportunities you want to conquer—and most importantly, where you can find the data to support this initiative. Connectivity matters. By connecting devices, machines and objects together, data will conform to information that can be used to make informed business decisions, in real-time. But you can't get there without first understanding what your primary focus should be.

IoT has brought businesses to the point where they now have the understanding to identify the integration of solutions they already have, or, determine components they need to replace, in order to get there. However, it's safe to say that as technology advances, more opportunities for manufacturers will become evident. Two ways that will impact the future for manufacturers to do business lie in data and customization.

Exponential growth in data capabilities will continue to drive insightful decision-making abilities—leading to actions that are impactful to the success of your business. Customization will allow you to create different products uniquely tailored to your business. The opportunities for customization are far-ranging, especially for small to medium-sized manufacturing businesses that recognize how to take advantage of these opportunities—for a competitive advantage.

SYSPRO™
Simplifying your Success

CONCLUSION

Achieving and sustaining excellence in manufacturing requires businesses to "connect" their people, processes, and technology. Beyond connected devices, as part of the IoT revolution, is the lasting impact this revolutionary technology will have on your people and processes.

Manufacturers are constantly looking for ways to increase productivity, accelerate operational output, and achieve sustainable growth. Many manufacturing businesses struggle with the need to maximize quality and performance—while attempting to minimize costs.

While there is no "magic bullet" to achieve manufacturing excellence, innovation can lead to excellence, and can be derived from various parts of an organization. People, processes and technology must all be considered when exploring alternative designs or solutions like IIoT, in the pursuit of excellence.

Assessing opportunity costs to develop different, innovative methodologies, is the first step in the journey towards lasting and substantial change. Cultivating a synergistic culture through leadership—in order to create an environment based on combined strengths, concepts and skills—is a proven approach for delivering world-class performance and a competitive advantage.

By automating business processes and establishing greater visibility into the productivity of plant operations, businesses can "connect" the dots in their operations, and provide themselves with a substantial advantage over their competitors. Connecting the shop floor to the "top floor" with plant data, transmitted in real-time, to senior management, sales teams and centralized business systems (such as ERP) can enable executive teams to make rapid, better-informed business decisions.

SYSPRO™
Simplifying your Success

ABOUT SYSPRO

SYSPRO software is an award-winning, best-of-breed Enterprise Resource Planning (ERP) software solution for cost-effective on-premise and cloud-based utilization.

Industry analysts rank SYSPRO software among the finest, best-in-class enterprise resourceplanning solutions in the world. SYSPRO software's powerful features, simplicityof use, scalability, information visibility, analytic/reporting capabilities, business processand rapid deployment methodology are unmatched in its sector.

SYSPRO, formed in 1978, has earned the trust of thousands of companies globally. SYSPRO's ability to grow with its customers and its adherence to developing technology,based on the needs of customers, is why SYSPRO enjoys one of the highest customerretention rates in the industry.

Next steps:

If you want to learn how SYSPRO can help connect your shop floor to your "top floor", contact us today at info@ca.syspro.com or +1 (888) 259-6666.