

Igniting the Industrial Profit Engine

The vast potential of IIoT is finally giving industrial companies the ability to control their business performance in real time and drive operational profitability improvements – safely and sustainably.

by Peter G. Martin PhD

Executive summary

Connectivity, networking, Big Data, predictive analytics, cloud computing, fog computing, wireless communication, cyber physical systems, edge computing—the IIoT is gaining acceptance each and every day, and it offers unprecedented promise. While all discussion swirls around emerging technology and its potential, thought leaders know it can help industrial manufacturers extend real-time control across their value chain. That is the true financial value of IIoT. But how can we make it happen?

IloT: Better Pace, Better Handling, Better Control

A fever is sweeping across the industrial landscape. Connectivity, networking, Big Data, predictive analytics, cloud computing, fog computing, wireless communication, cyber physical systems, edge computing – they are all gaining acceptance each and every day, and, when taken together, offer unprecedented promise.

In fact, some experts believe IloT is eliminating many of the constraints traditional technology has imposed on automation systems, particularly the constraints that limited the ability of those systems to improve operational profitability, which should be their *raison d'etre* to begin with.

For the most part, today's real-time process and logic control systems focus solely on improving the efficiency of a manufacturing or production process. But is that their only real value? Shouldn't these systems and the processes they control actually create tangible financial benefits? Sure, improving efficiency is important, but it is far from the only real-time business variable. To be successful, things like safety risk (including security risk and environmental risk), reliability risk and, most crucially, profitability, all of which have traditionally been managed daily, weekly or monthly, now must be controlled in real time too. This is the true promise of IloT.

The world is changing around us now more than ever. We face global challenges that are affecting all businesses. We are more connected than ever, presenting us with new digitization opportunities. The speed of industrial businesses has increased so much, it is impossible to manage performance—especially the performance of industrial assets—on artificial schedules. IloT has the potential to change that. New technology means we can simplify how automation strategies—both the strategy to align system components to specific control functions and the strategy to control plant assets—will be engineered and applied, making automation and control systems easier and less costly to implement. The real value of increasing the functionality of the systems and the performance of industrial assets, however, is that it enables these systems to move from maximizing only process efficiency, their historical target, to controlling all those other important real-time business variables too.

And when companies are able to control the safety, reliability and profitability of each and every asset within the enterprise in real time, all those assets will be continually optimized. This is the Profit Engine, and it will change the future of automation forever.

Turning the Key with Smart Control

Traditional process control has focused almost exclusively on improving the efficiency of the operation. But Schneider Electric technology and IloT expertise has cleared the road so companies can change lanes from controlling only efficiency to controlling other key business variables. Gifted with more connectivity and computing power, smarter, connected products, e.g., pumps, are now able to control, monitor and secure themselves to become autonomous assets. This better, automatic real-time control can then be extended upward, all the way to the value chain asset sets. We call this Smart Control, and it will revolutionize how companies drive real-time operational profitability improvements (OPI), safely.

Because of the traditional pace of industrial operations, as well as entrenched accounting and billing cycles, business management decisions have historically been made monthly. This archetype has persisted since the Industrial Revolution!

Today, industrial companies that are still trying to manage their operational profitability using outmoded monthly reporting cycles are failing. The world is moving too fast, and we're beginning to realize that making business management decisions once every 30 days is folly. While production processes are becoming easier to control, profitability is becoming even more difficult to control. Why? Because by the time business managers receive their monthly updates from whatever enterprise resource planning systems they use, the information is no longer relevant to the business decisions they need to make (or should have made). In other words, important business decisions, such as how to improve operational profitability, have slowly migrated out of the business management domain and into the real-time control domain.

But in the age of IIoT, business managers and plant personnel alike have never had more and better opportunities to measure and improve the profitability of their operations in real time. Driving OPI starts with optimizing the performance of each industrial asset so that it performs its prescribed work in the safest, most environmentally sustainable, reliable and efficient manner possible. Increased connectivity, computing power and technology means it is possible to put real-time control, interoperability and communication at every level, from the simplest plant asset all the way up to the supply chain. Empowered with the ability to control every asset in real time, even intangible assets like energy, raw materials and production, companies are now able to conduct business, especially the business functions that have been historically transactional, not according to any set schedule, but whenever it is most profitable for them.

That's what Smart Control is all about. It means the customer can manage and control all its business variables under a unified strategy. Operations and management are now in synch: Management understands the real-time variable constraints of the operation, including safety, reliability and efficiency risks; plant personnel understand the impact their decisions have on operational profitability in real time.

Taking the Wheel: A Truly Empowered Workforce Steers Performance



Smart Control does not diminish the role of the plant worker. On the contrary, in many cases, the asset controller doesn't know enough about process dynamics to automatically control these other business variables. And at many other times, there is simply a real business advantage to having a human serve as a critical component of the control loop. In these instances, the process needs to be controlled manually. Empowering the workforce to impact the business performance of every asset and asset set is a critical component of any control strategy.

Therefore, an effectively Empowered Workforce is at the wheel of the Profit Engine. Over the years, many new control strategies and initiatives were based on the idea that automatic control without human involvement was the best method to eliminate costs and maximize revenue. However, most of these initiatives failed because they overlooked the positive attributes humans possess and machines do not, from judgment and adaptability to the ability to deal with the unknown.

In the plant of the future, the industrial workforce will have more opportunities to become more critically involved in the business, leveraging IIoT to begin to control more than the efficiency of the process, which was the traditional goal. Soon the workforce will begin to control all those other important business variables too.

That means empowering the workforce to make real-time decisions that drive OPI needs to be a critical component of any control strategy. In today's fast-paced industrial environments, making the best real-time decisions quickly does not necessarily require more data; it might actually require less data but more high-level content and context, i.e., the right data. Providing the workforce with the most effective decision support systems, easy-to-use tools and easily understood information, received in a format that is easily actionable, enables them to make better, more effective business and operating decisions at the right time.

This is the essence of the Empowered Workforce. With autonomous assets feeding them data and predictive analytics, the Workforce, armed with stronger gear and better information, is Empowered to begin controlling every critical business variable in real time, thus driving measureable OPI, safely.

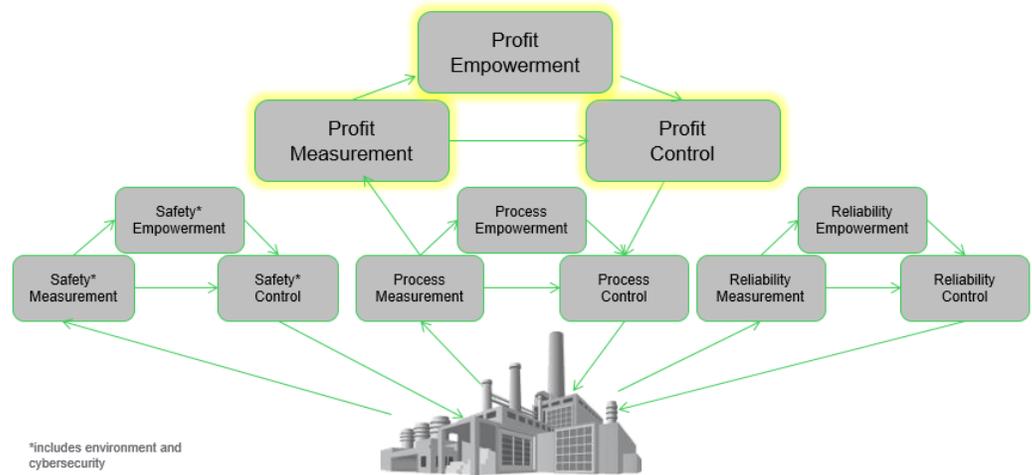
Optimized Assets: Firing on all Cylinders

There is a hierarchy of assets and asset sets within every industrial manufacturing operation. These assets and asset sets are combined with other industrial assets—things like energy, materials and production—to provide an overall hierarchical map of the industrial operation and enterprise.

When Smart Control, supported by an Empowered Workforce serving as part of the control strategy for specific assets and/or asset sets, is aligned with an asset-centric automation architecture, the performance of each and every industrial asset, from a piece of equipment all the way up the enterprise, can be continually optimized in real time. And when those assets are operating optimally across the four control domains, i.e., operating optimally safely, reliably, efficiently and profitably, then the entire industrial operation will perform optimally as well.

In fact, if this approach is fully implemented, each asset and asset set will operate autonomously and intelligently, pushing the enterprise as a whole to operate autonomously and intelligently too. Finally! The business can actually stop trying to manage its performance on a monthly or other artificial schedule and actually control it in real time.

Figure 1
Profit Engine Functional Architecture



The Race Has Begun—Full Speed Ahead

With the advent of IIoT, the industrial landscape is changing almost daily, despite challenges and barriers to adoption. But even with all the benefits this level of connectivity provides, almost every industrial operation is performing suboptimally when it comes to the potential business value it can generate. Applying Smart Control and Empowering the Workforce to control safety risk, cybersecurity risk, environmental risk, reliability risk and operational profitability in real time will change that trend, and it will convert traditional control and process automation systems into industrial Profit Engines.

The roadway is clear. Industry will soon be able to stop managing their business and actually control it, even business functions—like scheduling and planning—that until now were transactional.

Driving measureable operational profitability improvements – safely and sustainably – is the Future of Automation. Profit Engineers, start your engines.

About the author

Peter G. Martin, Ph.D., Vice President Business Value Consulting, Schneider Electric Dr. Martin has over 35 years in industrial control and automation. He has authored numerous articles, technical papers, and books. He holds multiple patents. Fortune named Dr. Martin a Hero of U.S. Manufacturing. He was also named as one of the 50 Most Influential Innovators of All Time by Intech, and received the Life Achievement Award by the International Society of Automation (ISA). In 2013 Dr. Martin was elected to the Process Automation Hall of Fame, and was selected as a Fellow of the International Society of Automation. He holds BA and MS degrees in Mathematics and an MA degree in Administration and Management, a Master of Biblical Studies degree, a PhD in Industrial Engineering, and a PhD in Biblical Studies.

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