Dynamic Blog

The Convergence of IT and OT in Manufacturing

Today's factories have a multitude of technologies to manage, with the two primary divisions being information technology (IT) and operational technology (OT). While these technology groups have traditionally been viewed as separate, distinct entities—operating on their own without reliance on the other—today's technological revolutions, and especially the Industrial Internet of Things (IIoT), are pushing the two to converge.

Defining IT and OT

It's important to recognize what sets IT and OT apart, in order to understand the challenges and benefits related to how they come together.

Information Technology (IT):

- Focuses on the entirety of information processing technologies
- Encompasses software, hardware, communications technologies and related services
- Deals with information
- Defined by programmable capacity
- Often capable of performing critical operations without human intervention

Operational Technology (OT):

- Focuses on technology that monitors and controls specific devices, processes and events within industrial workflows
- Detects and causes changes, such as heat control, emergency shutoffs and performance monitoring
- Deals with machines and the operation of their physical processes
- In its traditional form, often requires human intervention to perform actions

IT and OT have mostly maintained a clear distinction, never overlapping boundaries.

Initially, this was decided intentionally because of the different technologies involved and the different skills that were required for the two areas. Early IT systems were typically used for managing business applications in the front office and required programmers to operate them properly. On the other hand, OT was made up of fully complete and immediately operational proprietary systems that could only work on equipment specific to vendors.

However, in today's smart factories, IT and OT are merging—propelled by digital disruption and coming together to monitor and regulate critical business processes beyond typical IT workflows. Experts anticipate that the OT market will grow to more than $40 billion by 2022, with the primary drivers of this growth being the transformation of IIoT, increased demand for smart automation solutions, and a budding number of communication and monitoring machines.

Challenges

The convergence between these two types of technology doesn't come without challenges, though. The distinct separation between IT and OT departments has been long ingrained within the company culture and overall operational structure of many organizations, and a large number of executives and those in C-level roles are hesitant or outright resistant about making changes. Additionally, the two departments often hold opposing views on goals, projects, policies, and the people required to work on each team, which contribute to a lack of unity in overall operations and decision making. The convergence of IT and OT, and IoT-enabled devices, can also bring about many concerns regarding cybersecurity and compliance. Successfully blending IT and OT within the smart factory involves joint governance stemming from critical change management, where the entire workforce is in alignment with the project; this often requires remodeling and retraining employees, as well as changing procedures, to ensure company-wide cohesion.

Benefits

Bringing IT and OT together in the smart factory can provide manufacturers with many benefits, including creating a competitive advantage to help grow market share and market space. Gartner forecasts that by 2020, 50 percent of OT service providers will create key partnerships with IT-centric providers to develop IoT offerings. With the ability to create new efficiencies by applying the "smart" aspect and intelligence of IT to the tangible components of OT systems—such as using assembly line machinery, making it "connected" and bringing it online—plants and factories have so many opportunities to create positive change in their business and enhance overall efficiency.

One example of a successful IT/OT convergence in action involves real-time data insights. In the traditional manufacturing scenario, OT systems with temperature controls would display their readings through a closed-loop readout and allow employees on the plant floor to see if they needed to make any adjustments. However, IoT-connected technology, working with AI and machine learning, enables these temperature sensors to be connected to IT networks, yielding real-time communication with other components to automatically correct temperature levels for optimal performance. Essentially, the addition of IT to OT can help employees better allocate their time to mission-critical tasks by completing actions without the need for human oversight, promoting better performance and production capabilities.

In addition to improving manufacturing processes and increasing production performance, the convergence of IT and OT aids with cost reduction. A successful IT/OT merger can accelerate product-to-market times, increase consumer demand, reduce and often prevent downtime through predictive, real-time data analysis.

The key to reaping the benefits of successful IT/OT convergence is to break down silos within companies and ensure that both IT and OT departments understand the other's roles, objectives and challenges in order to work better together in creating a smart factory that is operating at its maximum potential.

To streamline the process of bringing together your company's IT and OT, contact Dynamic Computer Corporation. Our smart factory solutions are designed for efficiency, optimizing processes and improving productivity. Call 866-399-1084 or email us at info@dccit.com.

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