

Build an efficient manufacturing operation with Edge Computing



Manufacturing is a core industry in most regional economies and is the foundation of the Fourth Industrial Revolution.

Manufacturers are undergoing fast, disruptive changes in their operations as they automate their facilities with IoT, smart sensors, AI and robotics. They're striving to create a more agile production environment and supply chain that can adapt to market pressures and make changes on the fly. Industry 4.0 is taking shape as our ability to acquire, analyze and act on massive amounts of data shapes the global economy. Manufacturers can be at the forefront of this shift.

Challenge: Smart manufacturing requires the right underlying platform

Competitive advantage in manufacturing is built on constantly improving process efficiency. On the modern factory floor, capturing data is the key to this virtuous cycle of improvement.

Defects can be introduced into one step of the process, but they might not be caught until much later when they present a problem in another step. Data must be captured across the manufacturing process to perform that proactive root cause analysis. Data is also the key to further manufacturing automation. You cannot automate a process that has not been documented in tremendous detail. Even such, an automated process must still be monitored for any diversion from the specifications.

This operational data can be produced in huge volumes. Some of that data might be critical to refining operations. Some of it might be background noise.

These data volumes might also come in bursts, with long periods of very little activity.

Managing data flow and making the proper discriminations of important data bits must be done in real time.

Analyzing this incredible and potentially inconsistent volume of data is generally understood to be done in the cloud where artificial intelligence (AI) and machine learning (ML) can be applied. Those cloud datacenters, however, may be located thousands of miles away from wherever this data is being captured. Transporting every bit of data – the background noise along with the important bits – can be costly. Facilities running applications close to the edge, such as in an on-premises data center, might get low latency but not the flexibility of the cloud.

When algorithms are built to enhance operations through precision control of local resources, running that business logic in those cloud data centers introduces latency in the control functions. Consider robots moving about a factory floor in California. Controlling them from a cloud data center in Virginia introduces latency potentially compromising precision and the safety of any workers sharing the factory floor. Milliseconds matter.

Solution: Acquire, Analyze, Act architecture with edge computing capability

The technological underpinning of this new type of facility is an Acquire, Analyze, Act architectural solution. Intelligent Solutions from Lumen® Edge Computing integrates the consulting services, network and management services, hardware and software to architect and build an Edge Computing solution that powers these Acquire, Analyze, Act use cases.

The IoT will be deployed in these facilities to capture data. That data acquisition is just the first step in a much larger process of continuous improvement. Storage as a Service can be built into the network for edge resources on or off-premises – at the Metro level – depending on the needs. This creates a data “base camp” where the IoT-collected data can be stored as it is acquired. This alleviates constantly streaming data to the cloud over the network. This base camp can then provide some level of processing to separate the data that needs to be passed up to the cloud, optimizing the expensive analytics processing in the cloud.

Many cloud data centers that enterprises use for advanced analytics and AI processing are already on Lumen fiber networks. The cloud engines then build algorithms and business logic in the Analyze phase. Running them from the cloud introduces latency that can reach into the hundreds of milliseconds. In many cases, this latency creates a sub-optimal Act phase.

Lumen expands data center functionality out into the network on the Lumen platform that places key resources where they need to be to optimize this virtuous cycle. Often, this is in one of our facilities nearby, delivering 10ms or less latency. We can also move this capability into an on-premises data center for near-zero latency.

This logic can then be put into practice over local networks such as Wi-Fi or LTE on the factory floor. Lumen experts can design the entire solution and in most instances any equipment purchases can be incorporated into the same bill.

Results: Efficiency, security, lower costs

These architectures composed of Lumen Intelligent Solutions components, expertise and managed services can modernize manufacturing operations. Consider just a few effects of this edge computing infrastructure for manufacturing firms:

- Reduced latency for control applications in manufacturing facilities
- Edge-based security for sensitive data
- Lower network costs from transporting only relevant data to the cloud

Edge computing complements both cloud computing and the IoT, creating a seamless, low latency virtuous cycle.

Visit [Lumen](#) today for more information or contact a Lumen Expert for consultation to get started.

Edge computing puts data processing and storage closer to the network edge — where people, processes and items in motion reside.

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