Improving the resilience and security of operational technology in manufacturing

Maximize uptime and build operational resilience with Operational Technology Management
Table of contents

03 Introduction

04 The top four challenges facing OT systems

05 A new era of manufacturing demands a new approach to managing OT systems
   06 Visibility
   07 Digital workflows
   08 Vulnerability management

09 Conclusion
Introduction

Operational technology (OT) is the heartbeat of manufacturing, and it’s becoming more advanced—and complex—every year. The Industrial Internet of Things (IIoT) and Industry 4.0 are driving digitization faster than ever before. Most plant environments have become a highly interconnected environment of smart sensors, connected technologies, and data analytics.

However, OT’s digital transformation is incomplete. Many manufacturers still rely on spreadsheets and manual processes to manage their OT environment, and still may have an incomplete picture of their OT systems. It’s difficult to gain a full picture of operational technology—let alone efficiently secure, monitor, and manage it all. In an era of connected manufacturing, this approach just doesn’t scale.

One of the major consequences of this approach is that it introduces risk of unplanned downtime. As the OT environment becomes more digitally interconnected, so are the dependencies between devices. Entire operations could be halted due to a maintenance problem with one piece of machinery, putting production behind schedule. Without contextual visibility, one minor issue can present complications that quickly become very costly. In fact, just one hour of downtime for an automotive manufacturer can range in cost from $600,000 to $700,000 per hour, according to a Harbor Research Study.

This downtime risk is increasing as cyber criminals continue to target manufacturing. The number of reported ransomware attacks on manufacturing entities more than tripled in 2020 compared to the previous year, according to a report on industrial cybersecurity. These attacks pressure the c-suite to ensure security from the back office to the shop floor.

As manufacturers build toward their digital, connected future, they must prepare to overcome the major challenges facing their OT environments, or risk experiencing greater incidents of unplanned downtime.
The top four challenges facing OT systems

A new era of connected manufacturing demands a new approach to managing OT systems. Manufacturers face four major challenges in managing their current state:

1. **Lack of visibility**
   Many manufacturers lack of full picture of their OT systems. That information may be locked in disparate spreadsheets, or worse, in someone’s head. Even when a full inventory of OT systems does exist, it often can’t tell you how those systems work together. Information on dependencies and connections may be entirely missing. This makes it impossible to know how any specific change will impact other OT devices—one system patch could accidentally take down an entire production line.

2. **Manual processes**
   Speed and scalability are critical for manufacturers, and manual processes lack both. Today’s approach to OT management is full of labor-intensive processes—many of which take place without a paper trail (especially a digital one). It’s a method that is prone to errors and delays, drains productivity, and makes it hard to track compliance.

3. **Security risks**
   OT security is rife with data silos. While the ICS security space is booming, it’s still challenging to gain a complete view of all threats and vulnerabilities across endpoints. This makes it impossible to efficiently prioritize which events to respond to first. As the OT environment becomes more connected, this increases the risk that an issue will spread from one part of the operations to another, undermining your defense in depth strategy and increasing downtime and safety risks.

4. **Workforce challenges**
   Often, manufacturers rely on experienced workers to manage and maintain their OT systems. Many have been incredibly lucky to have long-tenured, knowledgeable workers who understand the plant floor, and how it works together. However, this approach is unlikely to work long term. As older workers retire, manufacturing organizations risk losing legacy knowledge, and may not have time for a new generation to play catch-up. The OT environment also continues to grow in its complexity and exposure to security risks. With these additional challenges, it’s unlikely that even the most skilled workers could keep it all in their heads.

Managing change in today’s OT environments

In today’s smart manufacturing environment, one small change can create an incredibly complex workflow. For instance, consider the steps involved in a software update on a piece of machinery:

1. An employee reviewing a spreadsheet or an email identifies the need for an update (hopefully, in a timely manner).
2. An email is sent to an employee to make the update.
3. The asset must be taken offline for a short time to make the update.

But without full visibility into the OT environment, this seemingly simple process can create a lot of questions. What other assets are connected to this piece of machinery, and how will they be affected when it’s offline? Who will need to be notified that this will happen? How and to whom is the completed task reported?

When you consider the number of changes needed in a given time period, you’re looking at a high potential for unplanned downtime.
A new era of manufacturing demands a new approach to managing OT systems

Operational Technology Management from ServiceNow:

Visibility
Provides a complete and contextual view of OT systems, so you can keep them secure—and up and running.

Digital workflows
Makes it easy to connect your operational technology to production processes and digital workflows.

Vulnerability management
Helps you see everything in one place, so you can assess, prioritize, and respond to events and threats.

Ultimately, you create a single system of action for your OT environment, improving experiences and driving outcomes across your manufacturing operations.
Develop a comprehensive, contextual view of OT assets

Manufacturers often rely on an Excel spreadsheet or disparate systems to list all their OT and ICS devices, which may only include basic information. It’s a challenge to keep the information current. At best, they’re reference tools; at worst, they’re incomplete or inaccurate.

In today’s digitally interconnected OT environment, you need to know exactly what your OT devices are and have good accountability of them.

Operational Technology Management gives you the ability to capture more dynamic information about OT devices—including system interconnectivity, data on updates/upgrades, and a ranking of operational criticality—and store it all in a secure cloud environment that is visible and accessible from anywhere.

With this end-to-end view in place, you can see a visual map of all the dependencies related to each device: giving you an instrumental tool to protect your operations from unplanned downtime.
Connect production processes to digital workflows

Once your OT system is mapped, Operational Technology Management connects your production processes to digital workflows.

For instance, Operational Technology Management can digitize key actions in OT maintenance processes. Instead of relying on manual back-and-forth and paper-based processes, Operational Technology Management enhances the workflow at every step:

Sample scenario: Maintenance process

The platform notifies and assigns maintenance tasks according to the maintenance schedule or process compliance needs.

The worker receives the notification and can find all the details they need in one cloud-based dashboard. This includes information on any dependencies for other machines or systems to prevent unintended consequences to taking the machine offline.

When the worker completes the task, they can mark the issue as closed.

The schedule is updated, so the manufacturer knows when the next maintenance cycle should take place.

Every action is digitally recorded—leaving a digital trail of activities in compliance with core processes. Employees and managers can easily access all the information they need on a secure, digital dashboard that they can view from any location.
Act quickly to resolve threats

Most manufacturers already have ICS/OT monitoring tools in place to scan for vulnerabilities and suspicious activity. However, as the number of endpoints and monitoring tools grows, it can be challenging to get a full view of threats and vulnerabilities. In toggling between different systems, it’s hard to prioritize what needs to happen now, and what can wait.

Operational Technology Management works across your existing systems and ecosystem of partners to create a single view of all ICS security data. With better line of sight, manufacturers can prioritize and remediate vulnerabilities faster.

Operational Technology Management offers a complete view of your entire OT security ecosystem and automated discovery of OT systems. It proactively understands the connections and dependencies between your systems to give you a map of all your assets. With one unified view, you can easily see how everything works together.

Then, digital workflows automatically route details into the right hands, whether it’s an engineer or OT security personnel. Our cloud-based platform serves as a single system of action: all parties have real-time information about every alert, its level of importance, and how to resolve it. And every step is automatically recorded, creating a transparent trail for compliance purposes.
Conclusion

Manufacturing is changing fast, and the old way of managing OT environments won’t keep up. It’s time to stop relying on manual processes and legacy knowledge and digitize operational technology management.

Purpose built for the OT environment, Operational Technology Management from ServiceNow provides a complete and contextual view of OT systems, so you can keep them secure—and up and running. Then, you connect your operational technology to production processes and digital workflows. Now that you can see your OT systems and links to production processes in one place, you can easily assess, prioritize, and respond to events and threats.

This approach unites IT and OT on one platform, creating a single system of action that improves experiences and drives outcomes across the manufacturing value chain.

FIND OUT HOW