Cisco, IBM and Rockwell Automation: Integrated Manufacturing Productivity for Automotive

**Meeting the challenge of automotive manufacturing productivity**

Automotive manufacturers face more competition than ever in an increasingly dynamic global market, characterized by shorter product lifecycles and rapidly changing consumer preferences. To compete effectively, they need to transform their current manufacturing and supply chain operations to become more demand-driven and cost effective.

The free flow of information can significantly improve operational efficiency. Companies must continue to improve factory throughput, reduce costs and waste, and drive greater efficiencies across increasingly complex global supply chains. Superior productivity requires connecting information from many suppliers—and from many systems and device types, including wireless devices.

Three industry leaders have teamed to develop and implement an integrated manufacturing productivity solution—from plant, to enterprise, and throughout the supply chain—utilizing industry-standard open technologies, and designed to bring you superior business performance.

The key is the effective and timely use of information. A true demand-driven manufacturing business requires basing production and planning decisions on real-time information. Compliance with new regulations also requires detailed lifecycle component traceability and reports.

Transforming this raw data into useful information can be difficult. It requires an enterprise-wide environment that will promote collaboration and securely share real-time information at every link in the manufacturing process—from the factory, to the enterprise, and throughout the supply chain with a wide range of partners.

**Highlights**

- Production and performance management capabilities yield access to real-time production information, facilitating collaboration between the factory floor and suppliers for demand-driven manufacturing, faster problem resolution, improved quality and higher factory throughput

- Increased visibility into inventory information throughout the supply chain facilitates forecasting and planning processes, minimizing inventory costs and shortages

- Provides an integrated approach to security that covers networks, applications, wireless and wired devices, and data to protect mission-critical operations

- Comprehensive project management that covers the entire manufacturing process, end-to-end

- Repeatable, proven best practices help to streamline global implementation and reduce risk
The reality of existing systems and processes

Today most automotive enterprises do not have an environment that promotes the effective sharing of information. While manufacturers have made considerable investments in ERP systems and specialized applications, production data from the manufacturing environment is typically still not directly linked to enterprise applications, resulting in incomplete and delayed reporting to management and supply chain partners.

Most automotive companies’ manufacturing and enterprise systems have been built up over time by different organizations using technologies from multiple vendors, and are, therefore, not necessarily designed to work together smoothly. Consequently, a significant percentage of IT budgets are spent supporting legacy and custom solutions instead of implementing new initiatives. Yet, a clean-sheet approach to implementing these new initiatives is rarely feasible. To meet the challenge, manufacturers must be able to integrate existing systems with new ones, extending the value of prior investments and transforming business processes to make optimum use of resources.

Opening up collaboration with supply chain partners adds its own complications to the mix. The complexity of managing access to sensitive information explodes as the manufacturer begins to work more closely with a supply chain that might encompass dozens of partners, each with unique needs.

Three companies, one solution

The multi-vendor solution leverages key offerings from Cisco, IBM and Rockwell Automation and allows automotive manufacturers to implement a real-time enterprise approach that enables state of the art production control, extensive visibility and secure collaboration.
The typical existing environment presents a significant barrier to transformation, but to remain competitive, change must take place—and it must be done in such a way that it does not hinder the company’s ability to meet its manufacturing performance goals.

**Cisco, IBM and Rockwell Automation: Integrated Manufacturing Productivity**

A solution to these challenges is now available. Thanks to a Cisco, IBM and Rockwell Automation partnership, automotive manufacturers and their supply chains can now take advantage of a comprehensive, integrated manufacturing productivity solution that enables them to share actionable information between their business systems, the plant floor and the supply chain.

The adoption of open standards offers an unprecedented opportunity to move toward a highly competitive automotive manufacturing structure. As multiple enablers, such as security and wireless protocols, converge on common standards, the opportunity to securely connect isolated islands of information is becoming more practical through factory and supply chain networking and successful application integration.

The multi-vendor solution is founded on strategic alignment around open industry standards, collaboration and leadership. It leverages key offerings from each company: Rockwell Automation’s plant-wide control and manufacturing execution solutions; IBM’s business process consulting, systems integration, platforms and middleware; and Cisco’s secure networking infrastructure, advanced wireless technologies and unified communications solutions. The combination of these strengths into one solution allows automotive manufacturers to implement a real-time enterprise approach that enables state-of-the-art production control, extensive visibility and secure collaboration.

Proven integration and use of best implementation practices also facilitates replication of the solution from plant to plant, so all facilities and all suppliers that participate in the manufacturer’s environment can communicate effectively. The cumulative benefit is to improve every aspect of the production cycle so manufacturers and suppliers can deliver the right high-quality vehicle or component, to the right location, at a lower cost and faster than ever before.

The solution is comprised of several integrated, optimized components that provide vital capabilities. Each implementation is tailored to the needs and requirements of the individual customer.

- **End-to-end business consulting and systems integration**: IBM provides its leading automotive supply chain business consulting and solution integration service to facilitate business process transformation, solution design and systems integration, start-to-finish.
- **Improved production control and real-time visibility of production information**: Rockwell Automation’s information-enabled Integrated Architecture,™ connected with the FactoryTalk® production management and performance software suite, dramatically simplifies real-time control and data collection from the production floor.

Integration with IBM WebSphere® middleware and Lotus® portal applications combines plant-wide production operations data with enterprise business systems, enhancing management visibility and decision making.
**Transforming quality management**

As vehicles grow more complex and suppliers assume an increasing role in delivering product innovations, quality management has become more challenging. It is essential to capture production data in real time and convert it to useful information which can be used to automatically adjust the production schedule.

Then, utilizing Cisco’s IP-enabled network infrastructure, the right information can be automatically distributed via a supplier portal system in real time to the right members of the enterprise and supply chain. By combining Cisco, IBM and Rockwell Automation capabilities, islands of data can be integrated and shared with enterprise users and partners to increase asset utilization and reduce time to market.

- **Unified communications capabilities:** With joint Cisco and IBM Unified Communications solutions, manufacturers can leverage a standard IP framework to enhance applications with messaging, alerts, customized phone displays, conferencing and even video to facilitate collaboration at every link in the manufacturing process.

- **Factory-to-enterprise-to-supply chain security:** The solution automates complex security management and can scale readily to large numbers of supplier partners and roles. Rockwell Automation software securely manages the data inside the applications and links production assets with the enterprise. IBM leverages its enterprise security expertise and integrates its security software with Cisco networking and Rockwell Automation applications to ensure the right data gets to the right person and only that person. And Cisco’s network security offerings are integrated with overall enterprise security to protect data as it is transmitted from the factory to the enterprise and throughout the supply chain.

Transforming quality management
- **Flexibility of wireless networking:** A wireless factory offers optimal flexibility and quick line reconfiguration without the need for costly, disruptive and time-consuming changes to infrastructure. The use of wireless devices throughout the supply chain can speed accurate data capture and lower costs. Cisco’s standards-based advanced wireless capabilities bring enterprise networking to the production floor, allowing the advantages of wireless devices to be securely integrated into manufacturing and supply chain operations.

**How it works**

The Cisco, IBM and Rockwell Automation offering for integrated manufacturing productivity helps automotive manufacturers become more demand-driven, lower their costs, and improve quality. Here are two examples:

- **Transforming quality management**

  As vehicles grow more complex and suppliers assume an increasing role in delivering product innovations, quality management has become more challenging. In the current environment, all components of an automobile must be tracked and reported on. Even minor tolerance changes can cause quality issues that will eventually result in higher warranty costs.

  It is essential to capture production data in real time and convert it to useful information which can be used to automatically adjust the production schedule. This information then must be efficiently distributed to managers and suppliers for additional decision making. Automotive manufacturers need real-time tracking of components as they go through the plant, along with the ability to integrate that data with timely quality monitoring analysis. In this way, they can obtain early warning of quality issues, diagnose root causes and address the issues as quickly as possible.

- **Rockwell Automation’s Integrated Architecture and FactoryTalk production management and performance suite executes error-proofed manufacturing on a build-to-order basis, as well as collecting production and assembly data from devices and plant systems. Its ability to track supplier part data enables traceability throughout the production process, meeting regulatory requirements and allowing visibility into every part of the vehicle.**

- **Cisco Ethernet to the Factory (ETTF) securely links the production network with the rest of the enterprise, bringing enterprise capabilities, such as wireless connectivity and unified communications, while leveraging robust IP networking security.**

- **By integrating device maintenance data collected on the factory floor via IBM Maximo® software, device performance degradation can be detected before it becomes serious, avoiding quality problems and preventing plant downtime.**

- **IBM manages the flow of production information, integrating it with enterprise systems by utilizing Cisco’s IP network infrastructure to share the data across the enterprise and the supply chain. IBM analytic tools are used to assess production data to detect potential quality problems and determine what data should be sent back to the Rockwell Automation production control systems in the factory, what data should be sent to the enterprise, and what data must be distributed to the supply chain. If a quality problem is detected, that information can be shared immediately and securely with suppliers, and collaboration can begin to ensure corrective action.**

- **IBM and Cisco’s joint Unified Communications solutions support real-time collaboration to solve quality problems as quickly as possible. For instance, if a problem is detected on the line, a wireless IP phone on the factory floor can be used to locate the people needed to resolve the problem.**
Using Cisco Unified Presence, the availability of required personnel (e.g., manufacturing management, key suppliers, product designers, etc.) can be viewed instantly. With a few clicks, these people can be notified of a meeting or sent an alert via e-mail, phone or instant message, giving them information they need to evaluate the situation and take corrective action.

- Security is integrated at every level. Rockwell Automation’s internal application security shares data through IBM Tivoli® access management and authorization, and the data is then moved through Cisco’s secure network to ensure security across all ecosystem partners and many device types, including wireless. IBM-Cisco device management enables network access only for devices that conform to defined security policies. Similarly, the Cisco ETTF network security architecture separates the production network from the enterprise network to restrict access by most enterprise users. The ability to securely include wireless devices means information can be captured automatically, without error-prone re-keying—the data is integrated and sent where it needs to go.

- The solution enables superior data integration, reporting and storage. Production data can be integrated with enterprise quality solutions such as warranty/recall systems. Communication logs are automatically maintained with IBM tools and Cisco network reporting to track who receives what information, and when.

The Cisco, IBM and Rockwell Automation offering for manufacturing productivity enables inventory monitoring throughout the supply chain and manufacturing process, helping keep factory throughput high and costs low.

Real-time inventory monitoring across the enterprise and supply chain

Using similar processes to capture, analyze, and securely communicate information in real time, the Cisco, IBM and Rockwell Automation offering for manufacturing productivity also enables inventory monitoring throughout the supply chain and the manufacturing process. The availability of timely, accurate inventory information keeps factory throughput high and costs low.

- By leveraging real-time enterprise information on order requirements, factory capacity, and supplier build schedules, the manufacturer can create forecasts and production plans that are based on accurate supplier inventory plans and designed to optimize manufacturing assets.

- Using wireless devices, inventory can be monitored on the production floor against schedule needs, and replacement inventory can be tracked through every phase of the shipment process.

- As vehicles are built, inventory data from plant systems is shared with ERP systems and communicated to suppliers. Consequently, suppliers both big and small can have ready access to up-to-date information so they can schedule inventory shipments to meet factory requirements and make sure parts are loaded in the correct order, keeping factory throughput high.
• Through deep application integration, IBM and Cisco Unified Communications solutions can be linked to ERP systems, so that if a part is missing or running low on a line, an automated message can be sent to a list of appropriate people to alert them. By setting rules, the message can be sent to a person’s home phone or mobile phone if it is after hours, or to a designee who is on call. An executive’s IP phone could even display up-to-date inventory and production information.

• Secure, real-time communications ensure that any changes regarding production plans and status are communicated to everyone at the factory, in the enterprise and at supply chain locations virtually immediately, so they can all react quickly.

Summary

The Cisco, IBM and Rockwell Automation offering for integrated manufacturing productivity is founded on deep industry knowledge, proven product integration and best practices acquired over many years by these three industry leaders. Access to real-time production information improves visibility and responsiveness, facilitating demand-driven manufacturing and supply chain operations. Consequently, quality problems can be diagnosed and resolved more quickly, with less waste of material.

Timely communications help suppliers produce and deliver the right inventory when and where it is needed, eliminating out-of-stock incidents that impact factory throughput. Better data access also allows these manufacturers to comply with regulations requiring lifecycle component history and parts traceability, as well as implement improved warranty tracking capabilities. This superior, integrated approach also enables enterprise security across all ecosystem partners and many device types, including wireless.

Execution of an integrated manufacturing productivity solution is critical. Automotive operations today are global, and manufacturers require strong leadership to execute and deploy solutions that are scalable, standards-based and easily replicable from plant to plant, around the world. The success of these projects mandates seamless execution across company and supply chain boundaries, and that requires teaming with the right solution partners.

Cisco, IBM and Rockwell Automation’s history of long-term collaboration and their successful global track record of delivering integrated solutions ensures that customers will have the benefit of a single point of contact responsible for coordinating our expert project managers, to design and implement end-to-end solutions that utilize best practices and reduce risk.
Proven expertise

The Cisco, IBM and Rockwell Automation offering for integrated manufacturing productivity is founded on deep industry knowledge, proven product integration and best practices acquired over many years by these three industry leaders.

Getting started

How and where you begin to improve your manufacturing and supply chain productivity will depend on your unique requirements and priorities. For instance, you may wish to start with one application in one plant, and once that is successful, expand to another plant. Or, you may want to start with a multi-application or multi-plant strategy. Regardless of how you begin, the important thing is to get started now to keep your company competitive in the future. We encourage you to start by contacting Cisco, IBM or Rockwell Automation. These three leaders will work with you to design the right approach, processes and plans to help you obtain the highest impact and the maximum return on your investment.

For more information

To learn more about how this solution can help you transform your automotive manufacturing operations, contact your Cisco, IBM or Rockwell Automation representative.

Or visit:
- www.cisco.com/go/ibm
- www.ibm.com/automotive
- www.ibm.com/cisco
- www.rockwellautomation.com/industries/automotive

Rockwell Automation global headquarters are located at:
1201 South Second Street
Milwaukee, WI 53204