orange™ Business

# Enhancing manufacturing performance with a secure, flexible infrastructure

## Accelerating the transition to the data-driven factory

**Sports franchises understand the importance that physical environments play in optimizing the capabilities of their athletes and spend millions on state-of-the-art training facilities. In the same way, physical infrastructures play a vital role in unlocking the high-performance culture to which all manufacturing companies aspire.**

Whatever the outcomes manufacturers seek from their digital transformation – increased efficiency, enhanced productivity, or improved quality – the transition to a data-driven organization underpins each of these goals. Robust and secure connectivity is a fundamental enabler of this strategy: it connects systems, allowing data to be correlated and analyzed to make factories smarter, safer, more profitable, and more sustainable.

Smart factories comprise an array of machines, sensors, and controllers. They all require a reliable, flexible infrastructure, allowing data to flow dynamically and production lines to be reconfigured without maintenance shutdowns. The infrastructure must give the networking teams full visibility into the network, connected devices, and data traffic to optimize processes and monitor for data security.

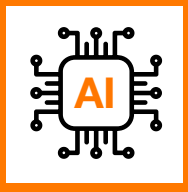
# Familiarize yourself with the field of play

**You need to adapt your game plan for the environment in which you are going to compete. And, like ballparks or football stadiums, no two manufacturing environments are the same. A networking roadmap is therefore essential for manufacturers to scale the data-driven factory concept and get real value from their operational data. Many factories, however, lack complete visibility of all their assets and which ones are networked. Some legacy machines have never actually been networked.**

Digital transformation does not mean ripping out all legacy systems and replacing them with new technologies. It is a step-by-step process, integrating the old with the new and connecting them through the most reliable networks. These can include Industrial Ethernet, WiFi, Bluetooth Low Energy (BLE), LoRaWAN, 4G LTE, and 5G – together with secure access to the cloud – to provide enterprise-wide communications that enable traffic to flow to the Internet from the closest link.

Another issue is basic logistics and safety. How are cables currently installed, and where are routers and switches housed? The most efficient cable layout must be considered when replacing a network infrastructure. This is also why ruggedized devices, built for durability and strength, are recommended for LAN and WLAN networks, rather than consumer-grade options.

In addition, factories are often harsh and hostile environments for standard wireless access points and devices, which can adversely impact their performance. And machinery can produce interference that produces noise on the radio frequency (RF) spectrum, disrupting the production process and delaying outputs.




**Only 44% of manufacturing leaders believe that their organisation are using collected data effectively.[1]**

2024 State of Manufacturing Report

[1] https://www.rockwellautomation.com/content/dam/rockwell-automation/documents/pdf/campaigns/state-of-smart-2024/9th-annual-state-of-smart-manufacturing-report-en.pdf

# A standardized playbook for connectivity

**In any sport, all the athletes must play by the same rules. The factory environment is no different. The underlying foundation of any data-driven factory is the ability to capture every single data endpoint, wherever it is located. That requires all the devices in your OT production environment to adhere to the same connectivity standards, irrespective of the underlying infrastructure. Here are the positions you need to cover.**

## 1 IT/OT assessment

Many manufacturers are unaware of the assets they have in a factory or how they are connected – if at all. In addition, some of the OT systems may be decades old. Traditionally, a network review is conducted periodically – as a result of an acquisition, for example. Manufacturers must run a network assessment to examine their current networking capabilities before drawing up a digital, cloud-oriented networking strategy.

## 2 Overarching OT Cybersecurity strategy

Ensure that your strategy covers network security, device security, and security monitoring and management. Make sure it has visibility at its core. Lack of visibility over their assets and processes prevents many manufacturers from having an overall understanding of the threats facing them. Ensure that the networking strategy is flexible enough to cope with changes in markets and demands and can be scaled accordingly. Network performance and availability are key. More capacity will be required as more devices are added to the network.

## 3 Run a network assessment

The factory can be a hostile environment for wireless communications given, for example, the amount of metal that exists, which can interfere with signals. Machines can also generate noise that isn't on the radio frequency spectrum. Ensure that wireless networks have the required signal strength and position the Wi-Fi antenna to cover the necessary space. Here, Wi-Fi spectrum analyzers can help with deployment and troubleshooting issues. This assessment will determine your organization's best networking solution.

## 4 Use LoRaWAN where geographical coverage is large and data volumes are small

Consider LoRaWAN networks for long-range, low-power projects. The advantage of LoRaWAN is its ability to distribute small bits of data across a wide area. It also combines a low cost of deployment and operation with excellent indoor penetration. As with any networking technology, it is important to develop a deployment strategy to ensure it achieves desired goals.

## 5 Investigate 5G for business model transformation

5G is a key enabler of data-driven ecosystems, helping manufacturers to drive better decision-making and enhance productivity. 5G's impact will not just be technological – It will accelerate the availability of high-quality AI training data from connected objects at scale. It will also support the use of autonomous guided vehicles (AGVs) and assisted worker technologies, based on augmented and virtual reality.

## 6 Revisit connectivity strategies regularly

Many manufacturers believe their global infrastructure is not delivering the expected performance. Yet, they have not looked at or revised their networking strategies for years. A resilient and secure network is crucial for supporting real-time transport automation, data analysis, and the integration of new technologies like AI.

**Orange Business recommends regular network infrastructure refreshes in manufacturing environments to ensure optimal performance, security, and adaptability to the evolving needs of Industry 4.0. This includes upgrading to technologies like WiFi 6 for increased bandwidth and lower latency, and leveraging options like BLE for enhanced connectivity and sensor capabilities. Before any network upgrade can be made, it is essential to understand why it is required. A regularly updated connectivity plan is an essential document in making this assessment.**

# Going for gold

**While performance means different things to different people, high performance can only be achieved through having visibility of every aspect of your business operations. Knowing where you are today is fundamental to understanding where you need to go tomorrow.**

That puts a premium on data and, in a heterogeneous OT environment, a successful data-driven factory depends on having a secure, mission-critical, high bandwidth, low latency network that provides centralized visibility and control.

A flexible and secure infrastructure is critical to interconnecting all the solutions and assets within the smart manufacturing environment. And, while edge computing and converged systems deliver significant business value and data insight, they also add complexity.

Planning a data-driven factory and supporting its wider ecosystem therefore needs a multidisciplinary approach that takes into consideration all aspects of operations – including connectivity, collaboration, production, and security. Most of our customers find that this is very much a team sport, and they rely on a trusted partner to help them build a future-proofed network that supports AI-driven hyper automation and robotics going forward.

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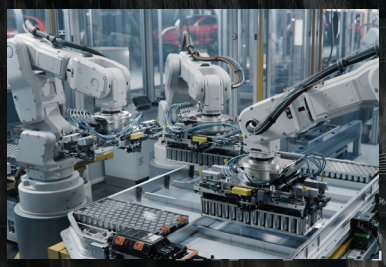

# Orange Business – on the side of its customers as they build data-driven businesses

**Orange Business has 2,200 global experts available to help you deliver a data-driven strategy. This allows you to maximize plant energy efficiencies, provide faster resolutions, seamlessly exchange data, enhance safety and quality control, track components across the value chain, and ensure on-time delivery. Our offering includes:**

- A consultancy-led approach to transforming data and creating value for the business
- Auditing data Assets and analytics maturity to create an overarching data-driven strategy
- Design and build a central Unified Namespace (UNS) as a centralized repositoryfor structured data to make it meaningful to all components in the enterprise
- Data governance expertise to ensure high quality of data and manage its use
- Help you focus on areas of your business where technology and a data-driven approach will have the greatest impact
- Create easy-to-use dashboards so employees can track and optimize product quality and efficiently manage all manufacturing-related costs