

# Digital transformation for packaging lines

How IIoT capabilities can help improve productivity

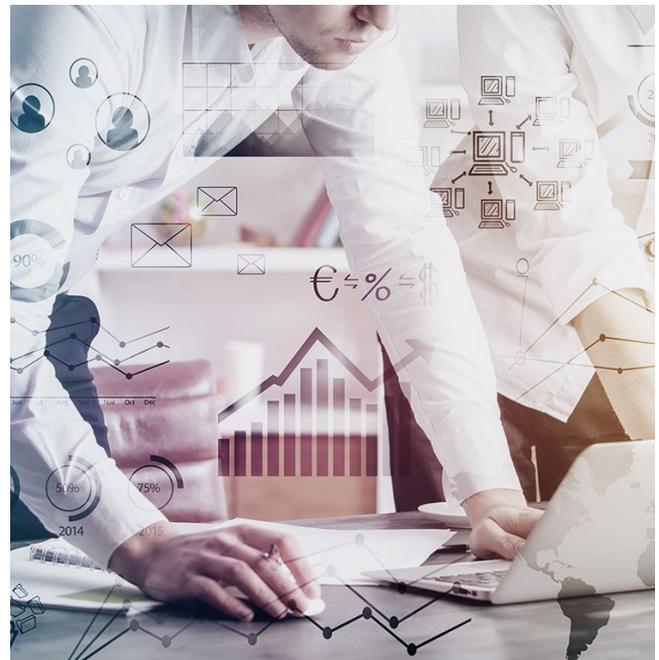


Fast Moving Consumer Goods (FMCG) brands that once enjoyed healthy mid-single-digit growth or better have encountered challenging headwinds recently. In this pressurized marketplace, lean manufacturing is becoming more and more crucial. And technology – especially internet-connecting technology – is key to such efforts.

**The business press frequently writes about the industrial Internet of Things (IIoT), the fast-growing inter-connectedness of the machines and systems that shape our businesses (and our lives). But the shining examples we read about tend to involve very expensive pieces of capital equipment such as combine harvesters, mining equipment and aircraft engines.**

**So while the IIoT may seem less relevant to the FMCG packaging line, especially for smaller companies, it's not. Even small consumer packaged goods (CPG) companies must recognize advancements in technology that can minimize IT intensity and fit within their budgets and scope.**

Furthermore, this thinking can inhibit the consideration of new lean technology. Plant teams may consciously avoid initiatives that involve significant IT resources, as these initiatives may be viewed as a “luxury” beyond the core mission of quality, delivery, inventory and productivity.





# How the IIoT can help enable lean practices on your packaging line

Industrial production is becoming increasingly more sophisticated. At the same time, production teams are asked to do more with the same resources. Technological and operational advancements are driving companies to place more emphasis on delivering against objective production metrics. This is evidenced by the rise in popularity of metrics such as OEE, including availability, performance and quality, as well as scrap and actual units produced.

Unplanned downtime can be very disruptive and strongly impact throughput on the production line, and a plant manager may not have the necessary data to develop insights into:

- **When or for how long unplanned downtime occurs**
- **Does it represent a flat or worsening trend**
- **Does it tend to occur at similar times of day or at irregular intervals**

Without this data, it is very challenging to look for “patterns of opportunity” in identifying issues, implementing countermeasures, and boosting productivity. Simply put, many packaging operations lack the foundation necessary to do lean manufacturing really well.

## Getting the data can be difficult

Baseline data showing what is happening on the line, such as uptime and OEE data, or even simple lists of downtime instances and associated fault conditions, often don't exist or are of insufficient quality to spur continuous improvement. Without it, managers need to rely more on observation, feedback, and intuition, making effective lean implementation nearly impossible.

## Varying equipment and software packages don't always communicate well

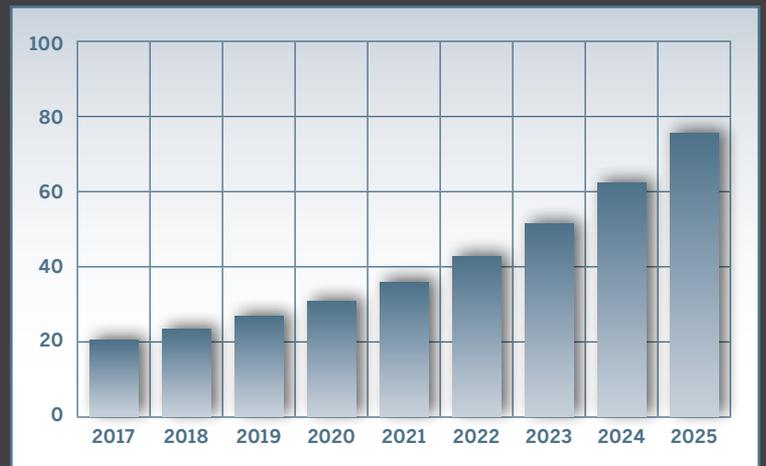
Packaging lines are often comprised of equipment from many different original equipment manufacturers (OEMs). These machines may speak different software languages, making it costly to monitor equipment using even simple Manufacturing Information Systems (MIS). This is often the root cause of challenging data collection, and can force plant teams to use logs with clipboards and spreadsheets. While admirable and necessary, these processes tend to be highly manual, making it difficult to scale and consolidate data collection, as well as frustrating for deriving insights from this data.

## Challenges across multiple shifts

When plants run two or three shifts, it can become a challenge for the plant manager to retain direct visibility of the operation 24/7. Multiple shift operations can also create inconsistencies in operational processes as well as gaps in available expertise for problem solving or troubleshooting during late hours.

**According to Statista, by 2020 the installed base of Internet of Things devices is forecast to grow to almost 31 billion worldwide.**

Source: <https://www.statista.com/statistics/471264/IIoT-number-of-connected-devices-worldwide/>



**Wasteful costs can lie hidden within the operation, unmeasured and unseen. While it may be easy to simply view this as a cost of doing business, there are easily-accessible technologies that can help drive lean within your organization.**

**Here are two examples:**

**1**

### **Connectivity**

Gone are the days when the only way to connect equipment was with hardwired Cat5 cabling. The recent wave of the IIoT has driven down the price of wireless connectivity significantly. A connectivity initiative that might have previously cost \$20,000 for installation of Cat5 wiring may now require less than \$1,000 of wireless cards and range-extenders. This minimal investment can pay off in savings from averted unplanned downtime events.

**2**

### **Data collection, consolidation, and viewing**

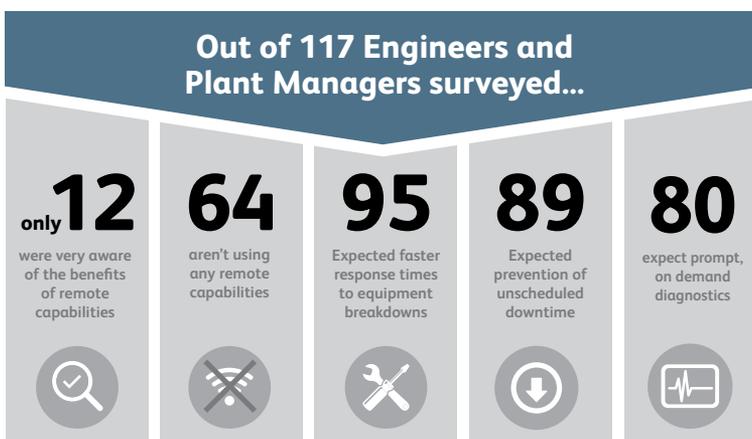
Recent changes in hardware and software allow manufacturers to collect operating data without extensive on-site IT involvement. Cloud-based software solutions are becoming the norm, simplifying implementation by dramatically minimizing IT involvement and requirements. Moving to a cloud-based solution eliminates dependency on plant-based PCs and servers and associated implementation and maintenance challenges. Data connections are simplified with common internet security protocols and standards.

**With cloud-based solutions, remote data access can be achieved, freeing managers from the constraints of being on-site to review plant or line performance. Moreover, the ability to connect, collect, consolidate, and view data and take corrective action can have a significant impact on reducing downtime. Automated alerts can also reduce downtime by sending text and email notifications of potential issues, helping maintenance and operations staff keep tabs on machine performance.**

# Moving “remote” beyond alerts to solving problems

## When we look at the language people use to describe remote capabilities and the IIoT, it’s easy to see why the topic can be confusing

Videojet surveyed engineers and plant managers in North America about both their understanding of remote capabilities and the benefits of using them. Our survey found that only 12 of 117 respondents were very aware of the benefits of remote capabilities. Seventy-nine out of 117 respondents were only somewhat familiar, while 23 respondents were not familiar at all. The results point to the need to clarify what remote capabilities are and how they can help keep lines and plants running more smoothly and predictably by today’s standards and the growing trend toward the IIoT.



## Defining remote capabilities

For plant managers, there is a significant difference between remote monitoring and remote service that can impact the time it takes to recover from a downtime incident.

**Remote monitoring** allows your equipment solution provider to see what might be causing downtime using some IIoT sensors. Then, using email or phone, this partner can remotely instruct you on a solution that you can implement yourself. If the problem is such that it can't be solved remotely, the partner can make a service call with important insights already in hand.

**Remote service**, on the other hand, is a much more comprehensive remote capability. Beyond sensor capabilities, remote service puts your partner squarely into your machinery, like a VPN system, unlocking access with full privileges. Remote service may allow your partner to address the issue for you, while teaching you how to optimize for the future. Without visiting your site, experts can support you by performing 24/7 analytics and real-time repair, shortening downtime and eliminating a significant percentage of service calls.

## A difference of service level

**While remote service may initially appear to be a “nice to have” vs. “must have” service, it can save you money, not only over the life of the machine through more uptime, but also up-front, in your contract.**

Videojet discovered that 70 percent of our customers’ printer service visits required no parts replacement, which suggested user error, setup error, parameter error or deficiency in cleaning or in process. Many of these issues can be identified and rectified quickly through IIoT-enabled remote service, without an on-site service call, resulting in cost savings for both you and your partner.

Remote service gives you and your partner access to more data; it also makes it easier for the partner to see the bigger picture of a downtime event or fault condition, supplying more detail and depth to identify corrective action. By combining your machine’s always-available data with event logs, the partner can parse out what’s happening in real time, more insightfully than by retroactively using your observational data that you’ve manually collected or estimated, which can slow down the process.

If you’ve noticed a gap between your machine’s performance and your expectations, it might relate to the limitations of mere remote monitoring. Remote monitoring helps shorten response times during periods of trouble or reduced operation, but the uptime results may not be sustainable. This is because during the remote repair process, your partner either has to make a field service visit or must turn over control to your operators to handle, which can prove difficult given the wide variety of machines in a packaging line and the expertise required to maintain them. Hence, the prevalence of service calls for problems that could otherwise be resolved remotely. Without actual control of the machine, your partner is like a mechanic watching a live video feed of the check engine light blinking on your dashboard, but lacking any power to apply the expertise to fix the problem.

**Remote service puts power back into the hands of your partner, leveraging the IIoT more powerfully, and directly addressing the most common root causes of downtime:**

- Environmental or application factors, such as higher duty cycles than anticipated
- Training or experience gaps among employees, despite everyone’s best efforts
- A lack of actionable data or the insufficient monitoring and analysis of data that’s been collected

## What we mean when we say . . .

	Remote Monitoring	Remote Service
<b>Notification timing</b>	<ul style="list-style-type: none"> <li>• Real-time device status</li> <li>• Real-time alert status change</li> </ul>	<ul style="list-style-type: none"> <li>• Real-time device status</li> <li>• Real-time alert status change</li> </ul>
<b>Access to data sets</b>	<ul style="list-style-type: none"> <li>• Sensor value history</li> </ul>	<ul style="list-style-type: none"> <li>• Sensor value history</li> <li>• Device event history</li> <li>• Production history</li> </ul>
<b>Speed of response</b>	<ul style="list-style-type: none"> <li>• Can dispatch on-site service call upon alert</li> </ul>	<ul style="list-style-type: none"> <li>• Can resolve 30% of issues in minutes</li> <li>• Can dispatch on-site service call upon alert</li> </ul>
<b>Diagnostics</b>	<ul style="list-style-type: none"> <li>• Performed on-site</li> </ul>	<ul style="list-style-type: none"> <li>• Performed remotely using real-time and historical data to determine the root cause</li> </ul>
<b>Access</b>	N/A	<ul style="list-style-type: none"> <li>• Full control or limited control over all device settings</li> </ul>
<b>Resolution</b>	<ul style="list-style-type: none"> <li>• Proactive on-site service delivery</li> <li>• Faster on-site response time</li> </ul>	<ul style="list-style-type: none"> <li>• Remote repair (eliminates majority of on-site service needs)</li> <li>• On-site repair, accelerated by remote diagnostics</li> <li>• Improves device performance through production line-specific service delivery</li> </ul>

## The future of production equipment with Remote Service and the IIoT

**Advances in smart technology will lead to an even greater level of operational visibility never experienced before. From a productivity standpoint, operators will be able to monitor equipment on the production line through a host of access points, with visibility to information in real-time at critical points of the process.**

The deployment of the IIoT and smart technology means that producers can potentially visualize any point of production through a convenient connected device at any time. Add advanced predictive capabilities to line equipment, and you now begin to harness the power of the IIoT to get advance notice of many potential issues before they actually happen.

As visibility of production line performance is paramount to increasing efficiency, the ability to understand where the potential risk of unscheduled downtime lies will be critical. Using remote service capabilities can deliver benefits in terms of rapid diagnosis and recovery from issues that can bring production lines to a halt. The ability to solve issues that can be fixed remotely without a technician coming on-site is beneficial to any production line. Minimizing disruption is the main goal with a remote service solution.

With the proliferation of products connecting to the IIoT, equipment suppliers will enjoy the benefits of continuously monitoring their machinery, often eliminating the need for on-site labor and travel costs. Suppliers will be able to gather performance data and help optimize the settings and design of equipment for their unique needs. Companies will need to share information with distribution partners and participate in a data-driven, decision-making culture.

Developing an understanding of how to use data, along with capabilities to transfer and store it, is crucial to achieving cost and efficiency savings.

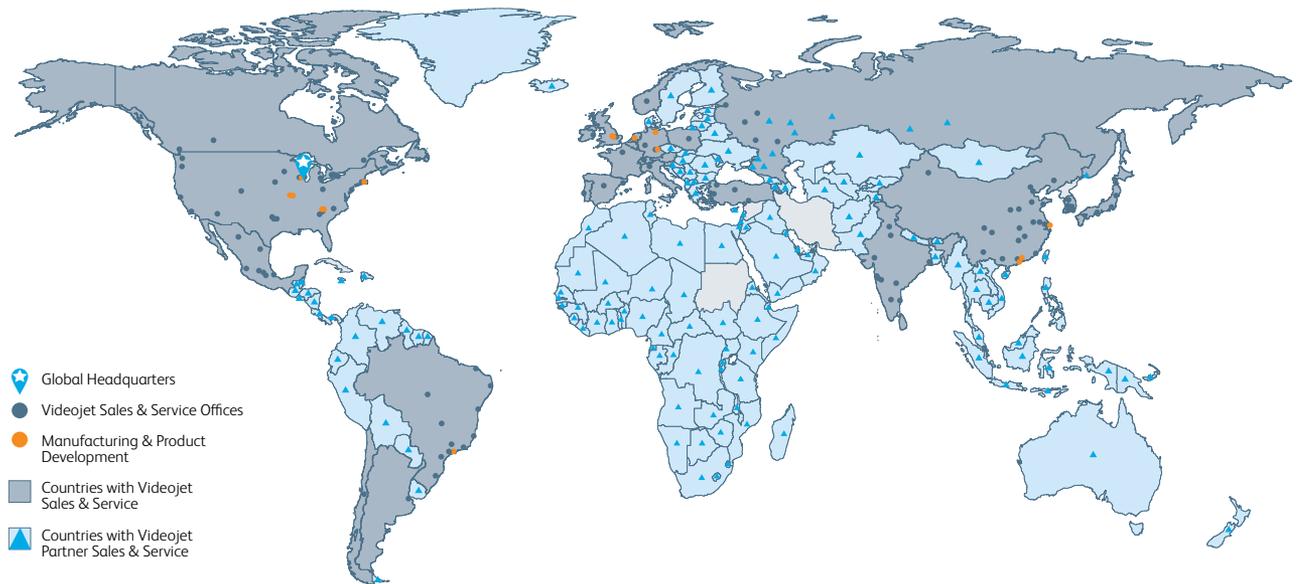


# Peace of mind comes as standard

Videojet Technologies is a world-leader in the product identification market, providing in-line printing, coding, and marking products, application specific fluids, and product life cycle services.

Our goal is to partner with our customers in the consumer packaged goods, pharmaceutical, and industrial goods industries to improve their productivity, to protect and grow their brands, and to stay ahead of industry trends and regulations. With our customer application experts and technology leadership in Continuous Inkjet (CIJ), Thermal Inkjet (TIJ), Laser Marking, Thermal Transfer Overprinting (TTO), case coding and labeling, and wide array printing, Videojet has more than 345,000 printers installed worldwide.

Our customers rely on Videojet products to print on over ten billion products daily. Customer sales, application, service, and training support is provided by direct operations with over 4,000 team members in 26 countries worldwide. In addition, the Videojet distribution network includes more than 400 distributors and OEMs, serving 135 countries.



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