PACKAGING WORLD

Tackling the Challenges of Interconnectivity in the Industry 4.0 Era

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in partnership with

DOMINO

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As any company grows, it needs to add more technologies—including software, hardware, and devices—across the organization. It also generates significantly more data, which when integrated properly can provide insight into operations, driving down costs and improving efficiency and even customer satisfaction.

Interconnectivity among disparate systems and devices allows manufacturers to gain key insights. Yet despite the push to adopt Industry 4.0 standards and solutions, some manufacturers are still shying away from interconnectivity, often due to concerns about cloud-based solutions.

However, those manufacturers that have embraced interconnectivity by implementing cloud-based solutions are experiencing improved visibility and reporting, lower costs, and other advantages. Getting started requires having a clear vision and pursuing this vision in small, manageable pieces that provide immediate ROI.

Adem Kulauzovic of Domino shared a vision for Industry 4.0 and described the advantages of interconnectivity and cloud-based solutions for industrial companies.

Key Takeaways

Interconnectivity provides the visibility and traceability necessary for brand protection.

Interconnectivity connects disparate systems and devices, improving production processes and providing the visibility and traceability that helps businesses protect their brands. Interconnectivity has several important benefits for manufacturers.

Feature	Benefit
Automation	Frees up space on production lines. This is especially beneficial during the current COVID-19 pandemic, where space is more limited than ever. Automation also generally benefits food and beverage companies and contract manufacturers and packagers, who are typically short on extra space on their production lines.
Visibility	Visual monitoring allows manufacturers to ensure the right product is going into the right box with the right label, ultimately cutting down on costly recalls due to mislabeling. Integrated vision, marking, and packaging systems can help manufacturers meet newer standards from the FDA.
Traceability	In the food industry, farm-to-fork traceability is increasingly popular among younger consumers who want to know where their foods are coming from. It also helps trace the paths of recalled foods.
Reporting	Integrated reporting, using data from across systems, gives manufacturers a complete view of operations.

Cloud-based solutions and proper planning help keep costs low.

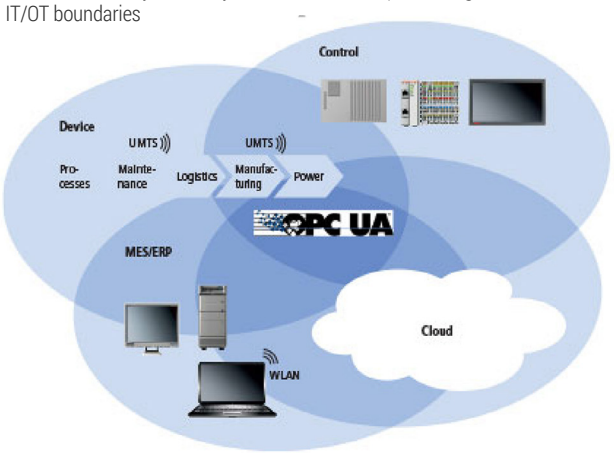
Cloud-based solutions provide manufacturers—especially smaller businesses—all of the benefits of interconnectivity without the significant overhead and cost that an on-premise system requires. Planning out the solution also keeps costs low and ensures key stakeholders and teams are on board.

While businesses have shied away from the cloud because of its perceived long-term cost, the reality is that haphazardly planned, on-premise solutions often cost significantly more. Inexpensive equipment that is purchased to alleviate short-term pains often becomes expensive to build out and maintain to meet growth, regulatory, security, and other needs.

> **"There's a stigma that [cloud] will cripple companies. But it doesn't become a money pit. In contrast, not investing in remote interconnectivity quickly becomes the money pit."**
>
> Adem Kulauzovic, Domino

With Industry 4.0, the sprawling setup of industrial networks—on-premise and in the cloud—also requires planning, especially to get both IT and OT (operational technology) stakeholders on board. Including all stakeholders from the start helps ensure that any concerns or issues are identified and resolved before they become project-stopping problems.

FIGURE 1 | Today's Industry 4.0 networks overlap and integrate across traditional IT/OT boundaries



Digital trust is more than security; it is about reliable, accurate, and timely data.

Interconnectivity requires digital trust. This encompasses the idea that the data that comes across the network is secure, as well as reliable, accurate, and timely. Digital trust and security does not mean developing a "Fort Knox" solution that isolates all systems from the internet. Isolated solutions:

- **Cost more,** requiring additional on-premise hardware, software, and personnel to support them, as well as upgrades to those solutions as the hardware and software become obsolete.
- **Are error prone**, as information needs to be re-keyed in across systems. Mistyped information introduces human error and delays, meaning the data is no longer reliable, accurate, and timely.
- **Are still subject to compromise.** A virus or malware on a USB stick used to transfer data between systems leads to the infection of all systems that interacted with that USB stick, even though they are isolated from the network.

Cloud service providers are experts in digital trust, from securing data to ensuring it is reliable, accurate, and timely.

Cloud solutions help keep costs low, especially when the data is grouped properly.

Businesses have often cited cost concerns as a reason they stay away from the cloud. When well understood and planned properly—especially for data transmission—cloud solutions can ultimately save manufacturers money.

Over the past several years, cloud vendors have gotten better at managing their data and systems, allowing customers to get top performance for low fees, often paid monthly or pay as you go.

To keep costs low, manufacturers moving to the cloud need to rethink how sending information between systems is handled. The table below shows advantages of rethinking integration in the cloud for programmable logic controllers (PLC) and supervisory control and data acquisition (SCADA) systems.

Traditional On-Premise Integration	New Cloud-Based Integration
Tags sent between PLC and SCADA each have their own data points, which are sent individually.	Cloud providers often charge by data point, so a store and forward approach is recommended. For integration between PLC and SCADA, this bundles tags and data points together, so that they are sent across as a single data point. Ordering is unimportant as the data is then retrieved as needed.

> **"If you plan this properly and you understand how to group your data in a manageable way, the cost of the cloud become very small."**
>
> Adem Kulauzovic, Domino

Develop a vision and tackle it in small, manageable, pieces.

Interconnectivity will benefit manufacturers, decreasing costs, improving data quality, and even making production more efficient. Developing a vision for these projects, as well as approaching them in small, manageable pieces that can show immediate return on investment (ROI), is critical to success.

Businesses need to begin by understanding the main objectives and outcomes they expect in adopting Industry 4.0 concepts, especially interconnectivity. This includes defining the issues they are trying to overcome, the significance of the data being used in the project, and how the project will influence positive change across the company.

Taking small steps and initially focusing on smaller projects within that larger vision is instrumental in getting company-wide support. Solving the business's biggest problems quickly has significant impact, and shows executive management how interconnectivity can ultimately save the company time, money, and resources. Small wins also make other company stakeholders more receptive to the proposed changes.

ABOUT DOMINO

Industry 4.0 is more than connecting things, and traceability codes are no exception. Are you leveraging your investments to their fullest? In today's fast-paced manufacturing environments, Industry 4.0 is becoming essential to uncovering inefficiencies. However, often key areas to leverage interconnectivity can be overlooked, such as variable printing coding, labeling and marking technology.

Since 1978, Domino's coding, marking and labelling range is designed to satisfy the compliance and productivity requirements of global manufacturers. These are typically deployed for the application of variable and authentication data, bar codes, promotional and unique traceability codes onto products and packaging.