

INFICON Inc. starts transition to electronic work instructions



Company	Sector	Size	Location
INFICON Inc.	Sensor technology and process control software for semiconductor industry	300 employees	U.S. headquarters based in East Syracuse, New York

At a glance

- Strong market demand for INFICON's products led the company to consider how Industry 4.0 could improve its operational efficiency. An initial digital-readiness assessment performed by RIT identified a list of best opportunities for leveraging digital technologies to move forward.
- Significant growth in INFICON's production workforce highlighted limitations in the company's paper-based work instruction system. As such, **electronic work instructions (EWI)** became a number-one priority in the company's digital transformation plan.
- Many software products provide EWI capability. Beyond business software like Microsoft Word or Adobe Acrobat, EWI software packages are designed specifically for authoring and deploying manufacturing process work instructions.
- A basic EWI platform can be used to present step-by-step instructions that can feature text, photos, and videos. They can also capture in-process data and track productivity.
- More advanced EWI products can facilitate connectivity to other software, such as an enterprise resource planning (ERP) platform to process status updates, monitor shop-floor material supplies, or submit process measurements or conformance issues directly into a quality-assurance package.
- RIT worked with INFICON to evaluate and select an EWI application that was best-suited to its unique manufacturing environment and business goals.

Company

INFICON Inc. is a publicly traded company that supplies a range of sectors—including the refrigeration equipment, automotive, optics, and semiconductor industries—with instrumentation, sensor technologies, and advanced process-control software.

Business challenge

An explosive surge in market demand for INFICON's hi-tech products that support semiconductor-chip manufacturing led to a ramp-up in new hires. The complex production procedures required for product assembly presented the company with a significant challenge: New personnel had to be trained quickly, all while quality and productivity could be continuously monitored.

The company's portfolio includes many variants of highly complex technological products and components. As such, assembly workers relied on a range of largely paper-based instructions that were often in different formats; workers referred to Microsoft Word documents on a personal computer or printouts of design files annotated with handwritten notes and adjustments.

The Industry 4.0 solution: Electronic work instructions

Industry 4.0 offers manufacturers new pathways for streamlining the flow of information across their operations. For INFICON, this came down to improving how production-line workers access and utilize work instructions for a range of products and components that are very complex to assemble. A more uniform, easier-to-update system with better usability would help speed the time new employees need to learn as well as ensure higher quality, more consistent results.

"By shifting to digital instructions we plan to improve our overall productivity and effectiveness."

Scott Walker, Vice President of U.S. operations, INFICON Inc.

Through RIT's consultation, INFICON's leadership saw an opportunity to digitize the company's work instructions process. The transition would fall into wider efforts to better leverage operational data to build greater shop-floor intelligence. RIT's Industry 4.0 experts helped INFICON set out a plan for updating its existing work instructions to an **electronic work instruction (EWI)** system.

Why electronic work instructions?

- A more dynamic and interactive experience than paper-based work instructions: EWIs offer a range of formats—from simple text and annotated graphics to video and even augmented reality (AR)—that can serve many different learning styles and training contexts.
- Easy to update, disseminate, and organize: EWIs are ideal for manufacturers with a wide variety of products—they can be efficiently sequenced alongside many variants to ease access and usability. They can also help to manage the challenges associated with design and process changes, ensuring that all work instructions on the shop floor are up to date.
- Faster, more flexible training: EWIs can dramatically change how new hires and technicians alike learn new jobs, work processes, or tasks. Digital instructions can be optimized for different work settings, and can be delivered to personal computers (PCs), laptops, tablets, smartphones, and AR-enabled headsets.
- The power of data unlocked: Many EWI software products can be used to collect operational data, such as operator process time. Some software products offer an EWI capability as part of a manufacturing execution system (MES), allowing for the capture of product-quality, equipment-state, and other data sources to troubleshoot problems and drive continuous improvement.



Approach

After assessing INFICON's location in East Syracuse, New York, engineers from RIT studied INFICON's existing work instructions in light of assembly, quality control, and product testing demands. They then looked to better understand how INFICON's work instructions were created and edited, starting with engineering and following the work flow through to floor release. Next, they documented all available data sources before sketching out ideas for an improved future process.

The information and insights that the RIT team gathered was used to assist INFICON with evaluating available EWI software products following a two-step process. First, a broad search based on INFICON's high-level requirements was done to arrive at a short list of potential EWI packages. Second, the short list was further refined through a more detailed analysis of features and performance based on product trials.

Solution

The software that is right for one company may not be right for another, even if the two seem similar in terms of size or sector. The data collected from across the organization provided an understanding of the most important features and capabilities a suitable EWI system should have. This discovery process allowed the RIT engineers to learn more about INFICON's overall manufacturing and product-development processes. It also helped them to evaluate the scope of the facility's information technology (IT) infrastructure as well as the role of employee preferences in terms of user experience. They also investigated the workflow driving the creation of work instructions, documenting how content is sourced, reviewed, and approved.

The results of RIT's research were translated into a list of essential features that were used to screen the short list of potential EWI packages. A final list of options with strong potential as best fits was developed. The RIT team then worked closely with INFICON's end users and production leadership to refine the list again to find the best possible options, subsequently arranging demonstrations and performing final assessments of features and capabilities.



Results and next steps

RIT's initial search included 38 different packages. Then, using the essential features identified alongside INFICON, they reduced this list to eight options. After these were presented to INFICON's leadership and further discovery of the features that would best serve INFICON's needs, the list was next down-selected to three EWI software packages: FactoryLogix (Aegis Software), Tulip, and VKS (Visual Knowledge Share). RIT then requested demonstrations of each of these from the relevant vendor.

INFICON chose to pursue FactoryLogix with a target of implementing in 2024.

Why FactoryLogix?

There are many different kinds of EWI packages on the market, each with a unique set of configuration and feature options alongside different pricing structures. While these differences make a simple apples-to-apples comparison between popular products difficult, starting with a company's unique needs and goals can help prioritize what matters most in a given instance.

In the end, INFICON chose the FactoryLogix because it

- offered a full MES platform with EWI natively integrated—pursuing an MES was on INFICON's original digitalization roadmap.
- would allow staff to trace part serial numbers and lots as a future capability.
- can be integrated into an ERP and quality-assurance system.
- relies on a local server to keep proprietary data within a secure, onsite firewall.

In addition to assisting INFICON to select a software package, RIT guided INFICON in considering other technology, infrastructure, and resource investments that a successful EWI program demands. These include the following:

- digital devices for workstations and mobile work
- Wi-Fi signal improvements
- internet bandwidth increases (if using a cloud-based package)
- staff time for generating EWI content