CASE STUDY

INDUSTRIAL INTERNET OF THINGS

# Industrial Internet of Things: A quick win for factory optimization

A global developer and manufacturer of automotive lighting systems sought to optimize one key aspect of their data collection process designed to monitor cycle times and determine whether delivery deadlines would be met. Their partnership with SYSTEMA resulted in an IIoT solution which proved to be a quick, cost- and effort-efficient means of obtaining accurate cycle time data and identifying bottlenecks.

SYSTEMA
Art of Automation

Manufacturers in the automotive supply chain have to meet high standards in quality and reliable delivery times.

# An Industry Challenge: On-time delivery

Automotive lighting system manufacturers supply a variety of lights and signaling units (headlights, rear clusters, interior lights, etc.) for installation in vehicles. Their ability to reliably deliver high-quality products on time and as ordered depends heavily on the ability to accurately assess the time it will take to produce the finished product. Failure to meet contractual obligations regarding delivery deadlines is met with steep financial penalties.

With the manual collection of production data as the basis for many KPI calculations, it becomes a challenge not only to accurately gather data but also to evaluate the data across production lines and production sites. Therefore, when there is an issue such as an equipment bottleneck, the ability to quickly detect it, relate it to a specific process or piece of equipment, and correct the problem becomes very time and resource-intensive.

Many of the top manufacturers in this market, who have been operating for more than a century, rely on legacy equipment and are motivated to exchange these labor-intensive, repetitive, error-prone, manual activities for automation by leveraging smart technologies.

This transition from human-driven activities to system-driven actions was what SYSTEMA was asked to help this manufacturer navigate.

# Manual data collection is tedious, labor-intensive, and error-prone

## IT Challenge: Legacy shop floor equipment

Though this automotive lighting manufacturer develops and produces very innovative technology, they (and many others in their industry) do so with older equipment that lacks the technological trappings necessary for automating even the most basic tasks, like calculating cycle times. As this was the case with this manufacturer, efforts to calculate cycle times were being conducted manually.

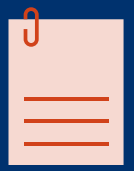
Manual data collection is tedious, labor-intensive, and error-prone. Adding insult to injury, collecting data on paper has some serious pitfalls and limitations including:

- creation of information silos
- inability to quickly analyze, and sometimes interpret, handwritten data to calculate KPIs
- undetectable anomalies, trends, or root causes of production issues

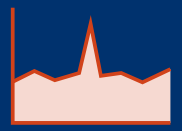
Making matters worse, the lack of user interface often associated with legacy equipment severely limits the production staff's ability to detect and diagnose equipment issues.

**Limitations of collecting data on paper:**

Creation of information silos



Inability to quickly analyze, and sometimes interpret, handwritten data to calculate KPIs

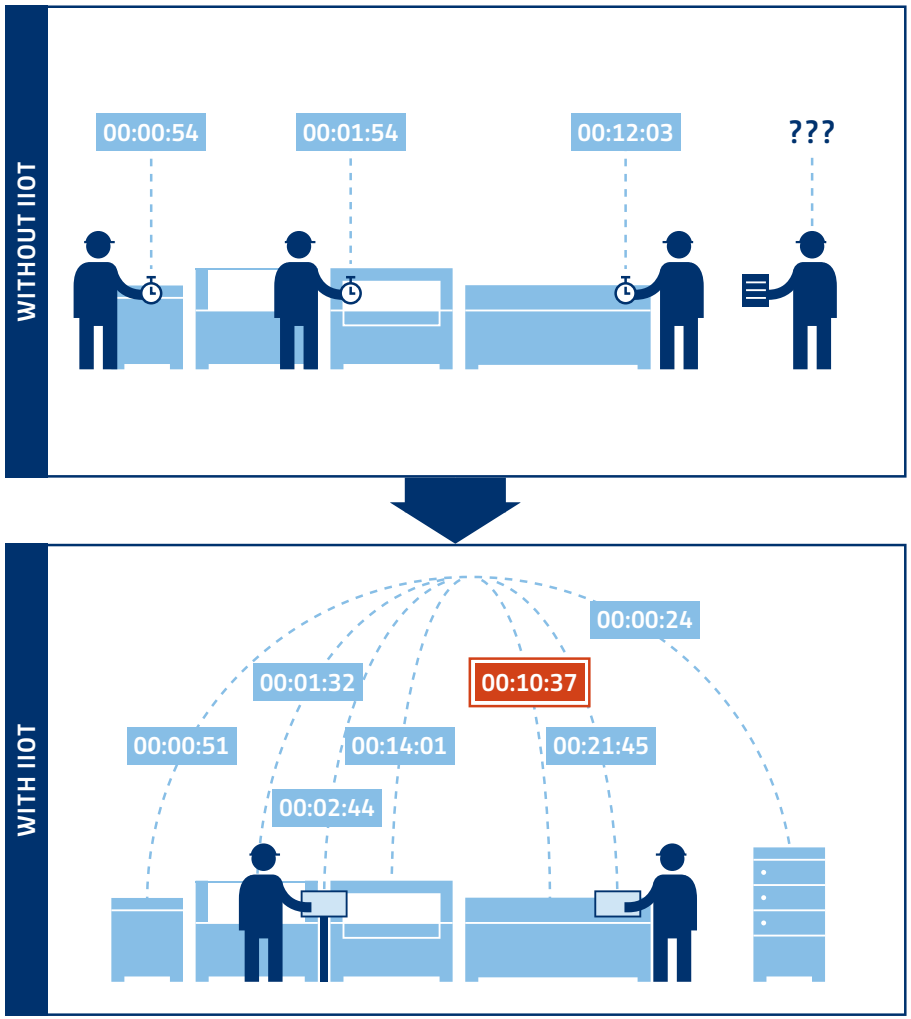


Undetectable anomalies, trends, or root causes of production issues

# Manufacturing Challenge: Determining the root cause of excess cycle times

This manufacturer's situation began when a customer order was accepted and delivery commitments were made based on projected cycle times for the product. Early on, it was noted that the actual throughput was significantly lower than it should have been for the product. To determine the true cycle time, shop floor personnel were tasked with manually clocking the track-in and out events with a stopwatch at each piece of equipment for each step of the production process. As a result, it became evident that the cycle times were much longer than they should have been and that there was a bottleneck somewhere, though, it wasn't clear where the bottleneck was occurring. Unfortunately, the addition of production lines wasn't solving the problem. Facing missed deadlines and unable to identify the root cause, this manufacturer consulted with SYSTEMA hoping to quickly get production back on track.

Manually tracking a deviance in the cycle times told the customer what went wrong but did not give a hint why.




## The Solution: Simple, yet elegant, IIoT retrofit

The first step was to automate the data collection process, eliminating the stopwatch and paper, to calculate true cycle time. This involved the installation of Advantech ADAM devices to provide the IoT capabilities required to capture signals from the equipment necessary for accurately and automatically calculating the cycle time at each piece of equipment, freeing up shop floor personnel for other activities, and improving the accuracy of cycle time calculations.

Once the cycle time data was collected, it was analyzed to determine the cause of the excessive cycle times. The analysis quickly identified a quality inspection step as the bottleneck. Further investigation determined that the Automated Optical Inspection (AOI) machine on the shop floor was malfunctioning. Over 80% of the AOI-detected errors were "false calls", causing production to stop unnecessarily for manual quality inspections. Consequently, the AOI equipment was replaced and production resumed in time for the orders to be produced and delivered on time. It should be mentioned that, though replacing multiple AOI machines was very expensive, they were able to recapture that expense within 3 months of resuming normal production activity.

## What's next for this manufacturer?

While this "firefighting" approach delivered immediate results, this manufacturer recognizes the value of a comprehensive approach to optimizing its manufacturing operations. Their introduction to SYSTEMA opened their eyes to possibilities for further optimization and visibility into their manufacturing operations across multiple sites. The next step? Serialized production and global manufacturing execution system rollout.

# Leveraging the possibilities for optimization and visibility with IIoT

More information about SYSTEMA's IIoT solutions
can be found at systema.com/iiot-services-and-solutions
or feel free to contact us at contact@systema.com

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