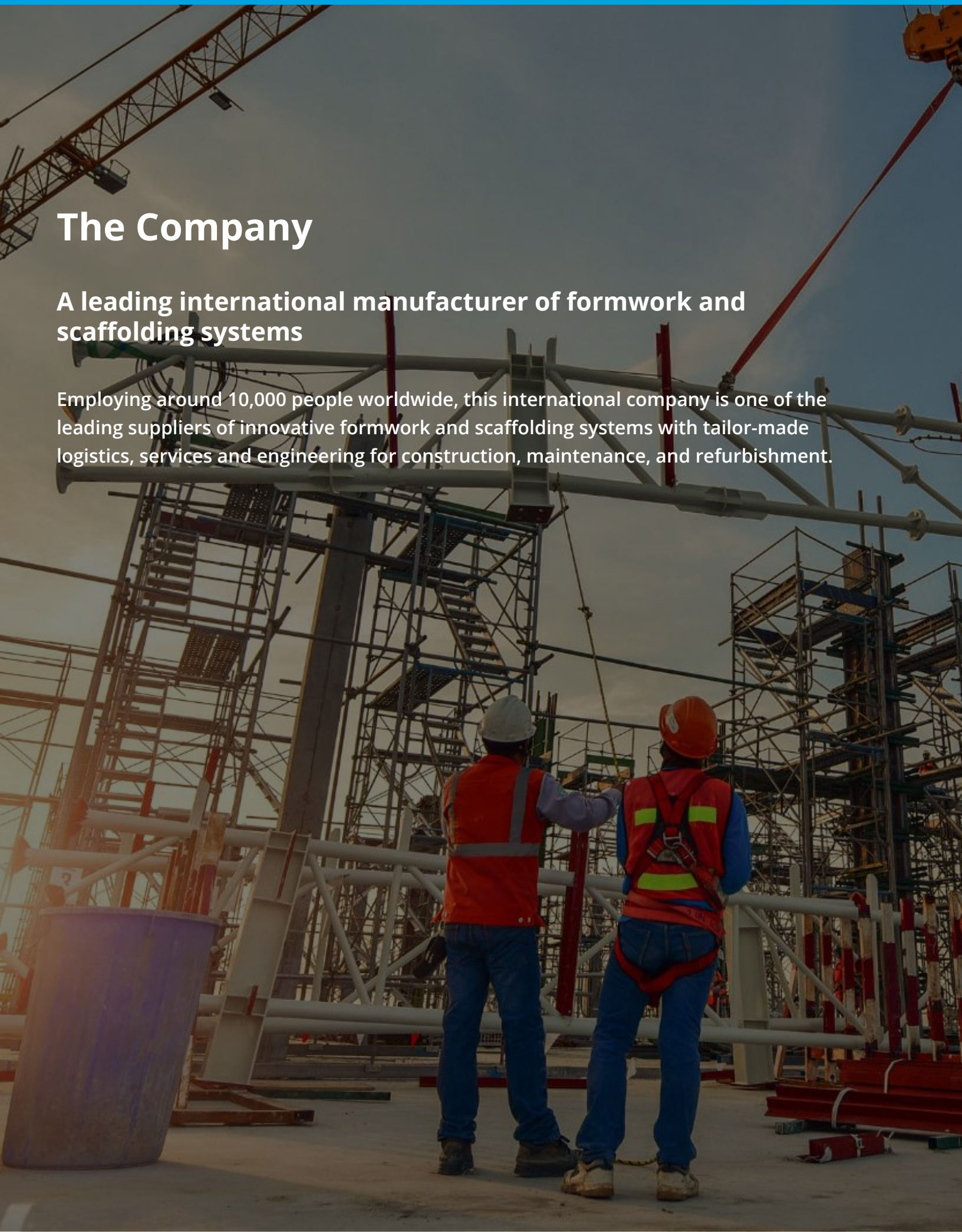
inpixon Indoor Intelligence™

CASE STUDY

INTRANAV®
An Inpixon Company

Smart Production

How Inpixon's INTRANAV IIoT platform helped international construction equipment manufacturing company increase material transport process control and digitize manufacturing processes through paperless handling



The Company

A leading international manufacturer of formwork and scaffolding systems

Employing around 10,000 people worldwide, this international company is one of the leading suppliers of innovative formwork and scaffolding systems with tailor-made logistics, services and engineering for construction, maintenance, and refurbishment.

The Challenge

Real-time location tracking of automated guided vehicles | Automate workflows |Create a paperless factory

One of the most successful international formwork and scaffolding manufacturers set out to find a solution to control and monitor the flow of material between production and the galvanizing plant. Driverless transport systems are used to automatically handle the transport of goods from A to B across a large area with various loading stations.

The routes are operated according to strict time specifications, however, the company was not able to monitor how the routes were actually executed nor where the automated guided vehicles (AGVs) were located in the daily process. Interruptions in the process flow resulted in long search times for the employees, including identification and determination of the cause which in turn led to delays in further processing. In addition, manual handling, such as the issuing of production documents, inhibits the seamless flow of materials.

In order to comply with first-in-first-out requirements in the galvanizing plant an immediate solution was sought that would allow for the automatic identification of goods produced.

Customer Requirements

Real-time location information about the load carriers in the plant

Precise real-time location information by tracking load carriers for scaffolding systems in production.

Implementation of the FIFO process

Implementation of the FIFO process in the galvanizing plant's material buffer using timestamps. INTRANAV.IO recognizes the different loading points of individual production plants, buffer locations, & their loading situation.

Material flow analysis

Analysis of resource utilization, zone dwell times, routes, and more for the load carriers and AGVs to be leveraged for the optimization of material flow processes.

Paperless Factory

Association and digitization of transport waybills with INTRANAV.RTLS TAGs.

Visualization of loading information

Visualization of loading information (part number and quantity) by means of a third-party software interface (automation & visualization software).

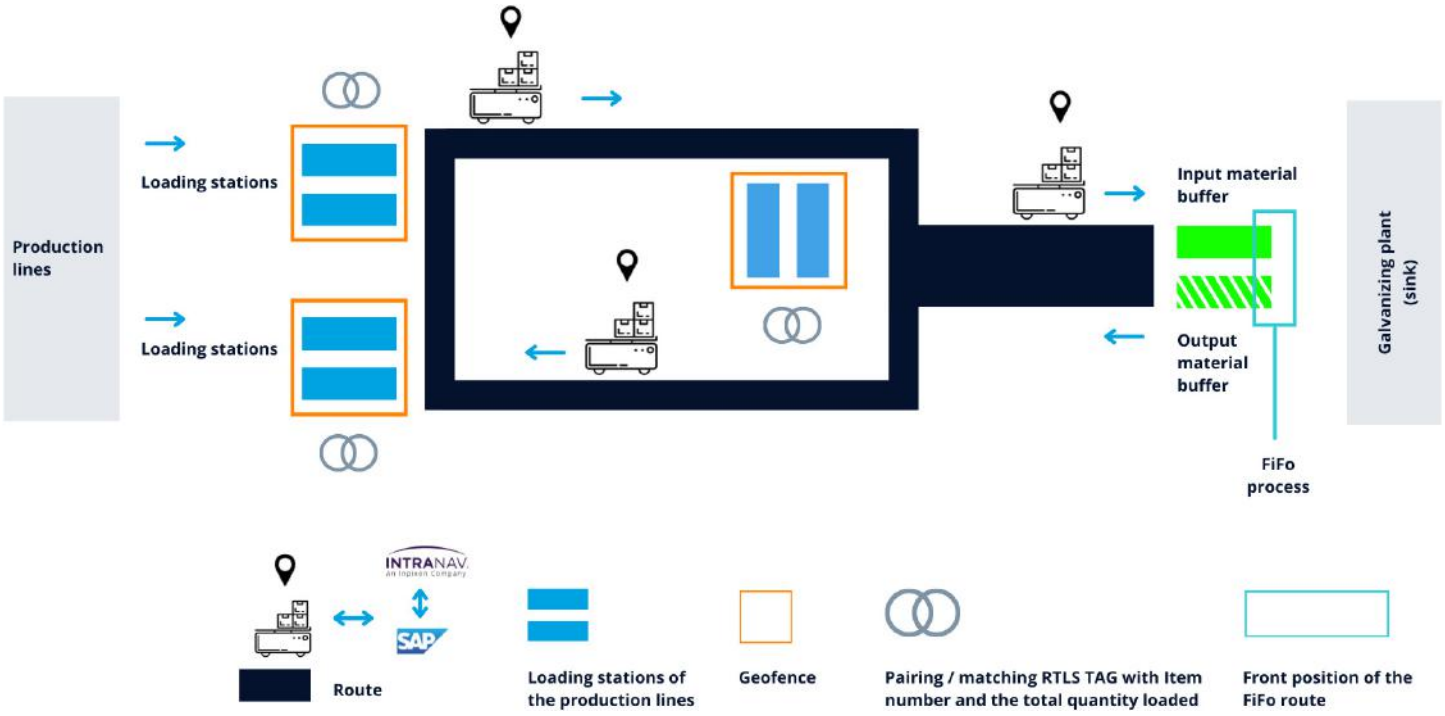
The Solution

Digital Twin - Material Transport Process Overview

The INTRANAV.IO **RTLS** is used for real-time location tracking of transport racks, loaded or empty, which are on their way from the metal processing plant to the galvanizing plant. The transport racks are carried by driverless transport vehicles (AGVs). The material flow between the fully automated and semi-automated production is tracked in real-time.

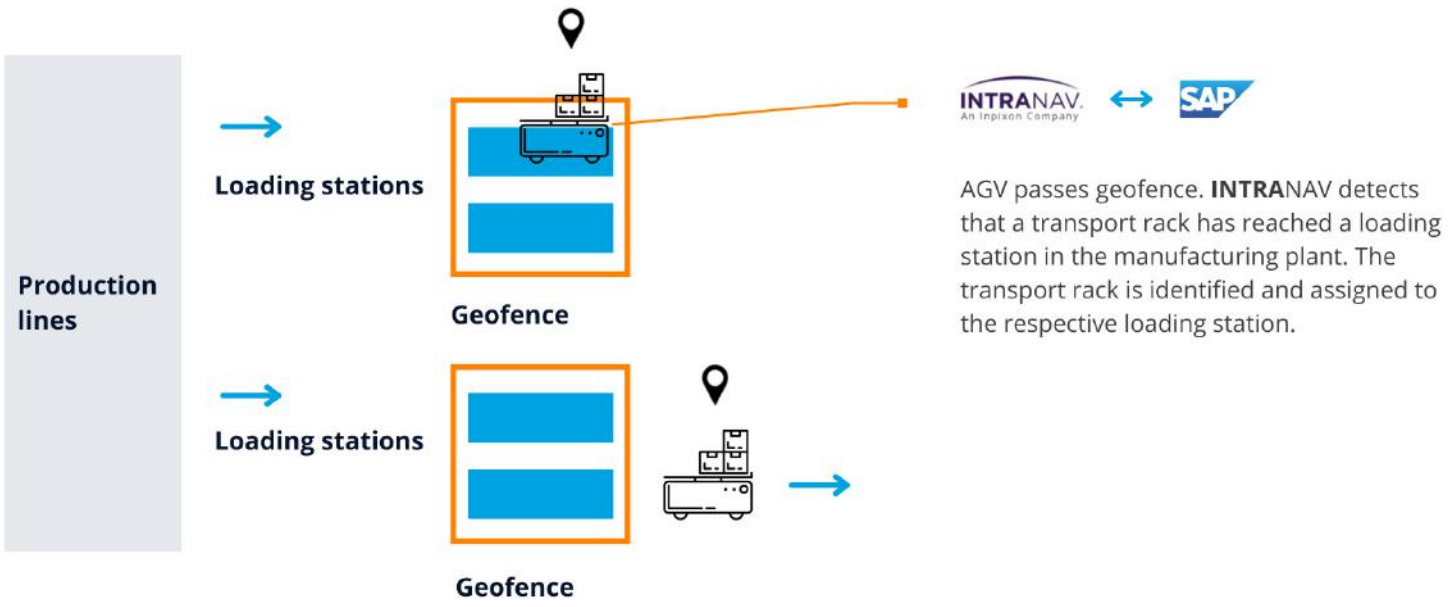
The “article number & quantity” details from the corresponding production line in the metal processing area is linked to the INTRANAV.RTLS TAG which is displayed on a monitor, ordered according to the FIFO process in the galvanizing plant. One monitor per material buffer (FIFO line) is installed, which displays the information of the corresponding material buffer.

The information linked to the INTRANAV.RTLS TAG has to be retrievable by an employee at any time. This is enabled by a barcode on the tag which displays the information on a browser app in the company’s internal WLAN via the contractor’s website.



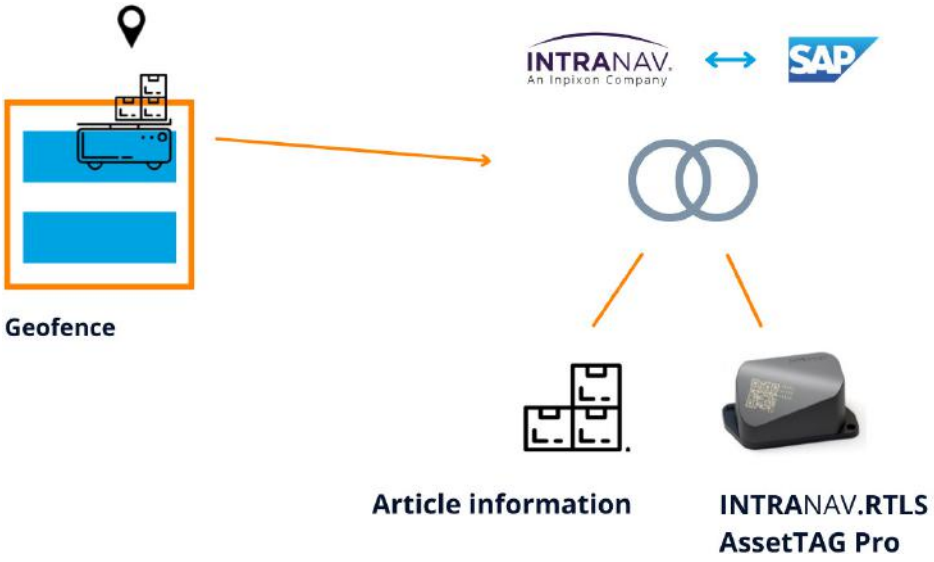
Automatically Integrate Transport Racks

Via virtual zones (geofences), the INTRANAV.RTLS identifies as soon as a transport rack from the production plant reaches one of the loading stations. The transport rack is then clearly assigned to the respective loading station. The system or the machine operator then loads the transport rack.



Associating the Transport and Article Information with RTLS Tags

When a transport rack is loaded and ready for pickup, the article number and total loaded quantity is linked to the INTRANAV.RTLS TAG via the INTRANAV.IO platform. In the case of fully automated production plants, the trigger for updating the information (after completion of the loading process) comes from the plant control system itself. For semi-automated production plants, the trigger is initiated by an employee using an Android, iOS, or Windows device. INTRANAV.IO accesses this data (article number/number of pieces) via an interface and links it to the TAG (the TAG ID) as described above.

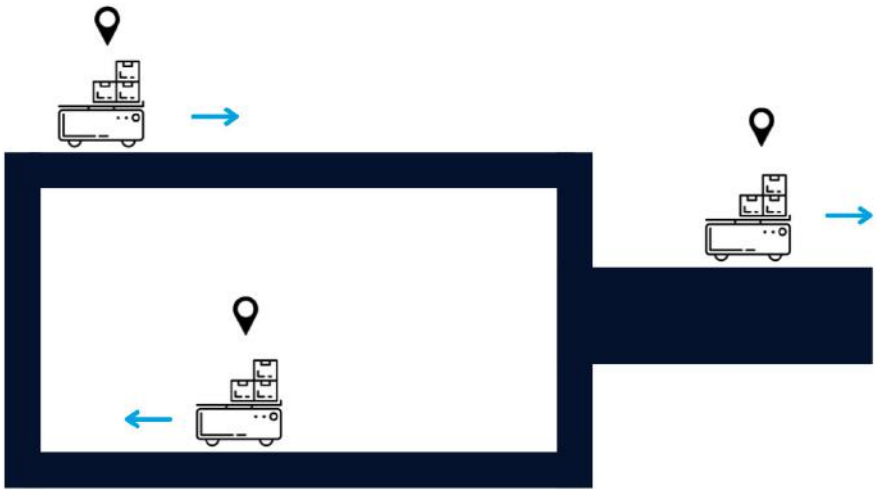


After the complete or partial loading of a transport rack, the information of the article number and the loaded total quantity is linked to the **INTRA**NAV.**RTLS** TAG via the **INTRA**NAV**.IO** platform as soon as the transport rack is ready for collection.

Real-Time Location Tracking of Load Carriers

The scaffold manufacturer tracks the transport racks, loaded or empty, in real-time via the Digital Twin platform, INTRANAV.IO, on their way from the metal processing plant to the galvanizing plant. The entire material flow between the fully and partially semi-automated production, which is carried out by driverless transport vehicles, is digitized via the INTRANAV IoT platform.

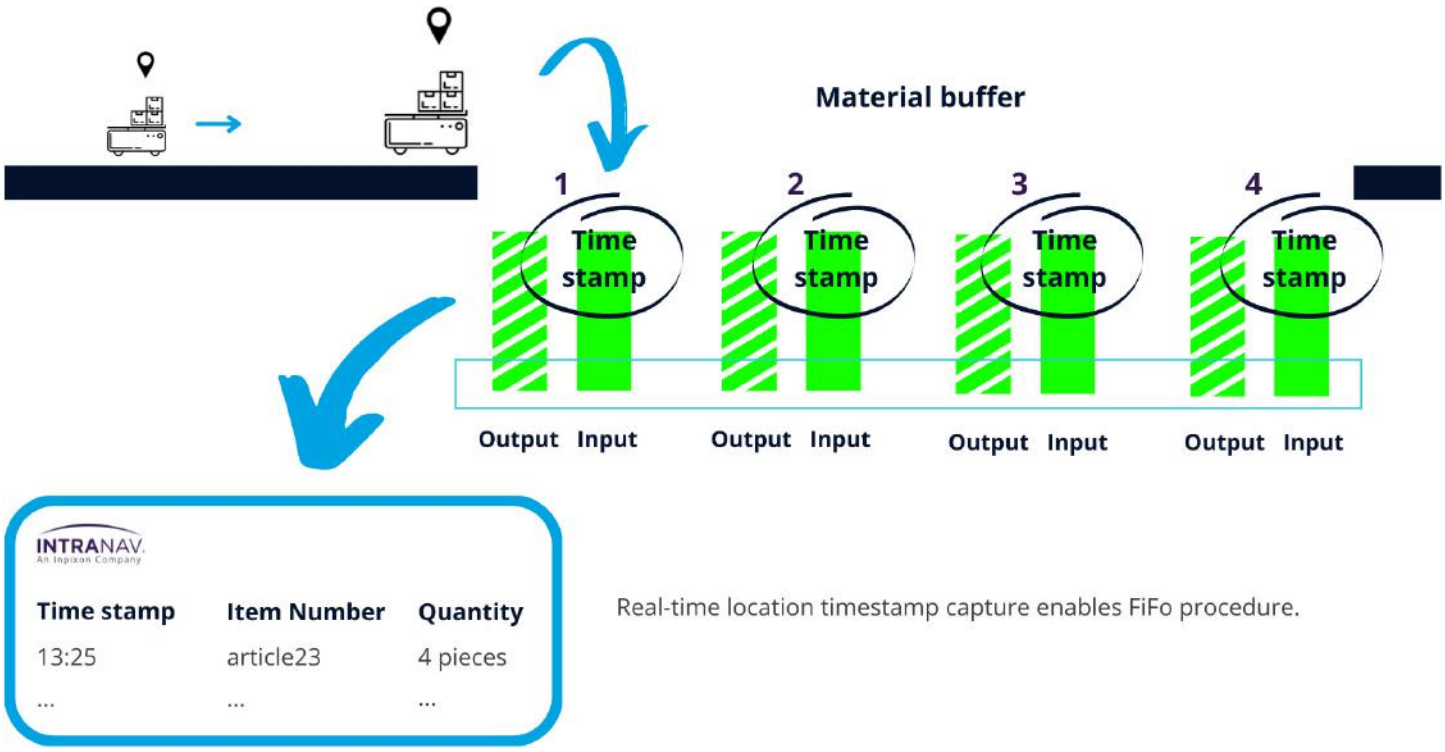
The IoT platform displays the production progress in real-time with the transport orders of the AGVs and their quantities. In the event of disruptions or bottlenecks, an alarm indicates a deviation in the process alerting employees to intervene immediately.



Tracks the transport racks loaded with items or even empty in real-time via the Digital Twin platform **INTRA**NAV.**IO** on their way from the metal processing plant to the galvanizing plant.

Dynamic FIFO Process

After transport by AGV, the transport rack is unloaded into one of four material buffers (depending on the contents) at the galvanizing plant. Items are hung up in the galvanizing plant using a conveyor system based on the FIFO principle. The transport point of the FIFO line must be identified, and the article number and quantity must be displayed on a screen at the FIFO line. Here, the sequence of the transport racks is defined based on the import timestamp into the respective geofence. The real sequence of the transport racks are displayed accordingly on a screen via INTRANAV.IO. The following transport rack in the material buffer lies with its long side directly against the previous transport rack. If the transport rack leaves the material buffer on the output section of the material buffer, the information disappears from the monitor and that of the subsequent transport rack appears. The distance between the input and output sections is at least 3,000 mm (length of the transport rack).



Real-time location timestamp capture enables FiFo procedure.

Analysis of Resource Utilization

Through an interface, real-time tracking data is imported in a structured format into industrial analysis software, which analyzes the overall resource utilization of AGVs and transport racks. The examination of the utilization and transit times, such as downtimes or throughput times, helps to identify weak points and improve them for the further course of production.

The Result

The INTRANAV Digital Twin can be used to monitor the progress of the control center of the material and transport process at any time. Integrating the article data into the respective rack completely eliminates the use of paper accompanying slips. Reviewing the real-time location data also helps the manufacturer to continually optimize transport and production processes.

Using the INTRANAV IoT platform, our customer achieved the following results:

- The automatic allocation of transport racks in the loading stations avoids the risk of mistakes, which helps to accelerate the loading process.
- Real-time location tracking of load carriers ensures direct traceability and real-time-based transport status updates. Production progress can be tracked in real-time via the control station in the context of an **indoor map**. The alert function increases the process reliability of the material transport, enabling fast intervention in the event of process delays.
- The dynamic FIFO process enables implementation and compliance with lean production design.
- With paperless material and transport handling, manual data entry is no longer required. Individual retrieval times, such as article number & quantity of transport racks and articles, are automated via a monitor.
- With integrations to other analysis software, the evaluation of real-time data and the continuous optimization of resource utilization of the transport process within production is enabled.

Key Benefits

There are many benefits to using Inpixon's smart factory solution, including:

- 100% process transparency about the material transport of AGVs
- Significant reductions in search times
- Increasing the process reliability of transport handling
- Reduction in process deviations
- Real-time timestamps reduce process deviations of the FIFO process
- Minimization of idle time and throughput times by analyzing resource utilization
- Digital handling eliminates manual data entry efforts freeing up time to invest in more value-added work
- Control capacities are 100% scalable

If Inpixon's INTRANAV IIoT production solution is of interest to you, contact us to talk about optimization possibilities for your production and logistics workflows today!

About INTRANAV, an Inpixon Company

INTRANAV, an Inpixon company, offers a highly flexible and cost-effective enterprise solution, ideally suited for automotive, aerospace, logistics or production. Further fields of application are for example, in the area of production line automation; automatic cycle feedback into SAP systems, line balancing/production leveling by INTRANAV SMART Factory, "Just in Sequence" – provision for the right sequence, plausibility checks or zone-based control of automatic programmable logic controllers.

If you're looking to optimize your production and logistics workflows, our INTRANAV Solution may be just what you need. We offer a comprehensive system that helps you to streamline your processes, saving you time and money. With our intuitive interface, you'll be able to quickly and easily find the information you need, when you need it. And our expert support team is always available to help you get the most out of our system. Contact us today to find out how we can help you take your business to the next level.

Let's talk about your goals.

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