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automotive manufacturing solutions

A new Vantage point

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Global focus
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OEM focus
Suzuki maintains independence while going beyond Japan

Technology
Servo presses take a big step forward

From paper labels to

From the Internet of Things to Industry 4.0, manufacturing is changing. Paper labels no longer fit process complexities; what's required is an optimal flexibility and quality assurance

For 40 years, paper has been a trusted flag in manufacturing, providing sequential work instructions for operators. This simple visual cue has been the core of a process which balances production and creates more efficient just-in-time inventory.

It may then be a surprise to many who work in the industry to find out that the static paper-based, or kanban, systems that have been at the core of material flow management for decades are also the number-one cause of factory inefficiency today.

With technology and customisation trends expanding how do factories keep up?

The automotive industry, for example, is under intense pressure to deliver new or refreshed models with ever more options at an accelerated rate. The most critical factor to success in expanding market share is rapidly introducing new models that meet or exceed customer requirements and staying ahead of competitors with features. Designers are using technology to shorten their cycles dramatically, putting the pressure on manufacturing to keep up.

Despite the need to change, it's easy to see why software or auto identification systems have been unsuccessful in replacing traditional paper: paper is simple, reliable, visual and familiar to the workforce. It can be used by both low-skilled labour and high-end operators.

However, it is highly inflexible. Once the paper label is placed onto a container and launched into the process, its instructions or trajectory cannot be changed without a significant amount of human resources or costly manual work-arounds. It cannot be wirelessly tracked or communicate with robots or machines on the line.

A next-generation system ideally needs all these attributes while still retaining the simplicity and reliability of paper.

"We've been in factories where containers were pulled off the line and were sitting for literally days or sometimes longer because no one knew what to do with them," says George E. Daddis, Jr, CEO of Omni-ID.

A view to the factory floor

Some common examples of challenges that are being solved today using the ProVIEW system:

Issue: Rescheduling/reassigning routes for work in process
When bottlenecks occur, it is prohibitively expensive for racks to be tracked down and new labels applied. Or, operators compensate by ignoring the instructions on the label to bypass issues. The result of this is chaos on the factory floor.

Resolution: Using existing systems to know what machines and operators are available and instantly use this information to send a message to the View tags to create optimised routing for each rack or smart container.

Issue: Out-of-sequence container or rack delivery
Parts are often hard to distinguish from one another – if installed in the wrong sequence it can destroy the value of an entire batch. This could result in a costly write-off of the entire WIP.

Resolution: Each View tag ensures that its rack or container is associated to a specific work process. If it arrives out of order, it automatically signals the operator with a message indicating that they should not use the materials as they have arrived out of order.

smart containers

Enter the IIoT and smart containers

The Industrial Internet of Things has been a key driver to bring new interactive technologies to existing processes like material flow management. This demand for technology to make material 'smart' has resulted in an innovative combination of e-Paper, RF communication and simple business logic called ProVIEW.

In most factories, the scheduling team meets in the mornings to determine the demand for the day and create the jobs and output for the day. The schedule is committed to hundreds of paper labels with instructions upon them and manually affixed to the racks of materials for the day – and the process begins. If something goes awry, new labels need to be reprinted and manually sent out onto the floor, resulting in process bottlenecks with no way to quickly re-route materials.

Instead, a wirelessly updated, e-paper or 'View' tag is placed on containers routing through the manufacturing process. Unlike paper, the screen can change instructions along the route to tell operators what to do with them next and where they should go if there are bottlenecks or other issues. These 'smart' containers also become immediately traceable in real time. With e-paper replacing paper, View tags fit seamlessly into most existing process, with a multitude of additional benefits that paper simply cannot provide. This system is the first of its kind to provide paperless, wireless and interactive material flow management along with end-to-end process visibility.

The ProVIEW system also provides a complete two-way feedback communication loop – the tags tell the operators what to do with them, operators execute instructions and interact with the system for confirmation of action, such as a call for parts or changes to the 'as built' records with the simple push of a button. Machines can also interact via wireless communication with the material. All the actions are tracked and stored, enabling process tracking and analytics.

Every rack, item, container on the factory floor is tracked by its location, state and condition – which can be dynamically changed at any time to accommodate a work flow change.

Repurposing some material for another part of the line or staging it to balance flow? No problem. Machine is down and material needs to be re-routed to optimise output?

Testimonial

"ProVIEW's Pick Application reduced our average pick times from 47.5 to 29.2 seconds and our accuracy on quantity and sequence was dramatically better with the visual instructions right at the point of picking.

"Most impressive for us, is the ease of use of the system. New workers could jump in and be effective immediately because of the easy visual cues and instructions.

Setting up a new picking cell when we reconfigured lines used to take more than a week. Using the wireless tags and simple software, last month we did a changeover in two hours using just the line operators, no IT.

– Plant manager, tier one supplier

ProVIEW can take care of that.

The electronic View tag simply replaces the paper in key processes such as; picking, replenishment, container management and work instructions, minimal to no training is necessary for operators!

ProVIEW user Detroit Diesel, for example, found that, unlike paper and other traditional electronic tagging solutions, ProVIEW is an IoT solution that provides the ability to not only track materials, but control the flows. The process visibility and control that the system provides creates a number of efficiencies – not to mention the savings from the paper alone.

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Issue: Updating build instructions for WIP

Updating build instructions, especially during the production process, is difficult. For instance, if tooling is serviced or updated at any given station an extra QA step must be added to qualify the new tool.

Resolution: Build instructions are easily changed in real time with the ProVIEW system to accommodate for quality or process changes. The View tags are equipped with buttons to provide a means for the operator to indicate that the QA has been done and is automatically notated to the system.

Issue: Reconfiguring pick areas

Setting up to enable optimal picking when a new job is put to the floor can take a week or two depending on the installation of shelves, racks, configuring or even coding the picking software to match the setup. With changes happening more and more often, this wasted time is becoming significant in the overall efficiency.

Resolution: Wireless View tags make it easy to swap out parts or reset a pick area. View tags can be quickly mounted where they are needed with simple Velcro tape or snap in brackets. What took a week can literally take an hour, making multiple changeovers possible for competitive advantage.