TECH OFFER

Material and Tools Tracking in Manufacturing

KEY INFORMATION

TECHNOLOGY CATEGORY:
Infocomm - Robotics & Automation
Logistics - Inventory Management
Infocomm - Video/Image Analysis & Computer Vision
Manufacturing - Assembly, Automation & Robotics

TECHNOLOGY READINESS LEVEL (TRL): TRL7
COUNTRY: SINGAPORE
ID NUMBER: TO174945

OVERVIEW

Effective tracking and management of Work-In-Progress (WIP) and inventory across a manufacturing facility are key to maintaining productivity and operational efficiency. Despite this, misplaced inventory and inefficient tracking remain common problems within the sector, leading to time wasted on locating items, losses due to unaccounted inventory, and ultimately, a reduction in productivity.

To tackle these challenges, an innovative solution has been developed that integrates advanced technologies, sophisticated hardware, and robust software features to optimize manufacturing operations. This solution provides real-time traceability of WIP and inventory throughout a factory, thereby reducing time wasted in locating items and preventing losses due to unaccounted inventory.

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The solution seamlessly integrates with various systems including Manufacturing Execution Systems (MES), Preventive Maintenance (PM) systems, and Enterprise Resource Planning (ERP) systems. This integration capability allows it to trigger alerts, visualize processes, and reduce waste, thereby streamlining operations and minimizing inefficiencies.

TECHNOLOGY FEATURES & SPECIFICATIONS

The track and trace solution are an amalgamation of sophisticated state of the art hardware and software components –

Hardware:

- Custom made racks and retrofits.
- LF/HF/UHF RFID for tagging and tracking.
- Barcode scanners for identification.
- Pick-to-Light systems for order picking.
- Weight sensors for inventory measurement.
- AI driven video analysis for surveillance and tracking.

Software:

- Work in progress (WIP) tracking.
- Inventory management.
- Preventive maintenance (PM) material tracking.
- In line material ordering.
- Data analytics.

The ideal collaboration partners for this solution would be manufacturing firms looking to optimize their operations, manufacturing execution system (MES) providers for system integration, hardware manufacturers for creating customized racks and hardware components, and technology companies focusing on RFID, AI, and data analytics. These partners would collectively contribute to the development, implementation, and continual enhancement of the track and trace solution.

POTENTIAL APPLICATIONS

The track and trace solution has wide applicability across a multitude of manufacturing industries where tracking and managing of tools, parts, and Work-In-Progress (WIP) items is crucial. Key industries include semiconductor manufacturing, automotive production, aerospace manufacturing, and other large-scale industrial setups.

In semiconductor manufacturing, it can be used to monitor the movement of sensitive materials like wafers and reticle masks. For the automotive and aerospace industries, it could be used to track the assembly of complex components, ensuring that all parts are accounted for and in the correct location.

The system's flexibility allows it to be applied on both large and small scales, catering to a vast range of operational needs. Its potential applications aren't limited to the tracking of physical items; the data it gathers can also be used for predictive analytics, proactive replenishment of inventory, and enhanced forecasting, among others. Consequently, products that can be marketed based on this technology range from inventory management systems and predictive maintenance solutions to data analytics software.

MARKET TRENDS & OPPORTUNITIES

The complexity of manufacturing processes continues to rise, fuelling the need for innovative and advanced tracking and traceability solutions. The increasing emphasis on lean manufacturing, cost-cutting, and waste reduction are some of the driving forces behind this demand.

Given these factors, the global market for such solutions is on an upward trajectory. As industries become more technologically reliant and digitized, the emphasis on precise, real-time tracking and traceability will only amplify. The market size, already sizable, is projected to witness substantial growth in the coming decade.

This technology is particularly attractive to the market due to its multi-faceted benefits - it does not merely track and trace, but also integrates with existing systems, enhances forecasting, and significantly improves operational efficiency. It's robust set of features and the capability to address multiple pain points make it an appealing choice for businesses across the manufacturing sector.

UNIQUE VALUE PROPOSITION

The track and trace solution provides a significant advancement over the current "State-of-the-Art". While traditional systems offer tracking and traceability, they often fall short when it comes to real-time data, seamless integration with existing systems, and the use of advanced technologies. This solution addresses these gaps by providing real-time tracking and traceability across the entire manufacturing process. This significantly reduces waste, enhances productivity, and improves operational efficiency.

In addition to superior tracking, this solution incorporates technologies like RFID and AI-based Video Analytics, providing unprecedented levels of precision and data insights. This also facilitates enhanced forecasting and inventory management capabilities, enabling businesses to better predict and meet their needs.

The solution seamlessly integrates with existing Manufacturing Execution Systems (MES), Preventive Maintenance (PM) systems, and Enterprise Resource Planning (ERP) systems. This feature ensures that businesses can implement the solution without significant disruption and harness their current platforms to achieve better efficiency.