



# Track & Trace Testbed

Nishantha Fernando  
Bosch Corporation  
2018/05/25





# Track & Trace: Creating visibility along the value chain



**Track**

Track geo-location (both indoor and outdoor) and usage of key assets

**Trace**

Capture key process performance data as input for continuous improvement

Three key use cases:

1. Extra-Logistics
2. Intra-Logistics
3. Manufacturing Process Tools





# 1. Track & Trace for Extra-Logistics

---

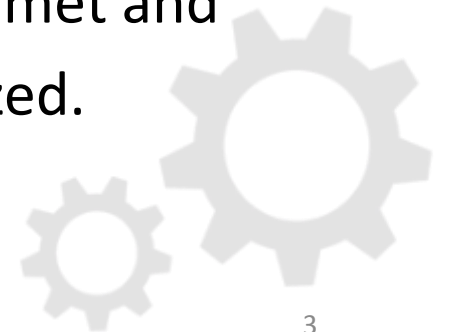


**For** all extra-logistics stakeholders

**who** want to accurately track and trace assets such as transport items and transport vehicles,

**our** testbed gathers data from transport-related assets

**to** ensure transport SLAs are met and logistics chain can be optimized.





# 1. Track & Trace for Extra-Logistics – Field Trials





## 2. Track & Trace for Intra-Logistics

---



**For** all intra-logistics stakeholders

**who** want to accurately track and trace products, parts and transport vehicles such as fork lifts,

**our** testbed gathers data and creates heat-maps

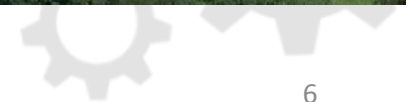
**to** ensure the intra-logistics meets the requirements of the manufacturing process





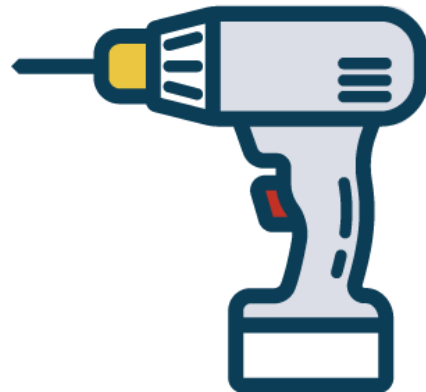


## 2. Track & Trace for Intra-Logistics – Field Trials



## 3. Track & Trace for Process Tools

---



**For** all stakeholders of process-oriented manufacturing

**who** want to accurately track and trace the usage of process tools, such as tightening, drilling, welding and measurement

**our** testbed gathers data on where and how these tools are used

**to** ensure the processes meet performance and quality requirements



# 3. Track & Trace for Process Tools – Field Trials

---







# Challenges and Solutions - Examples

---

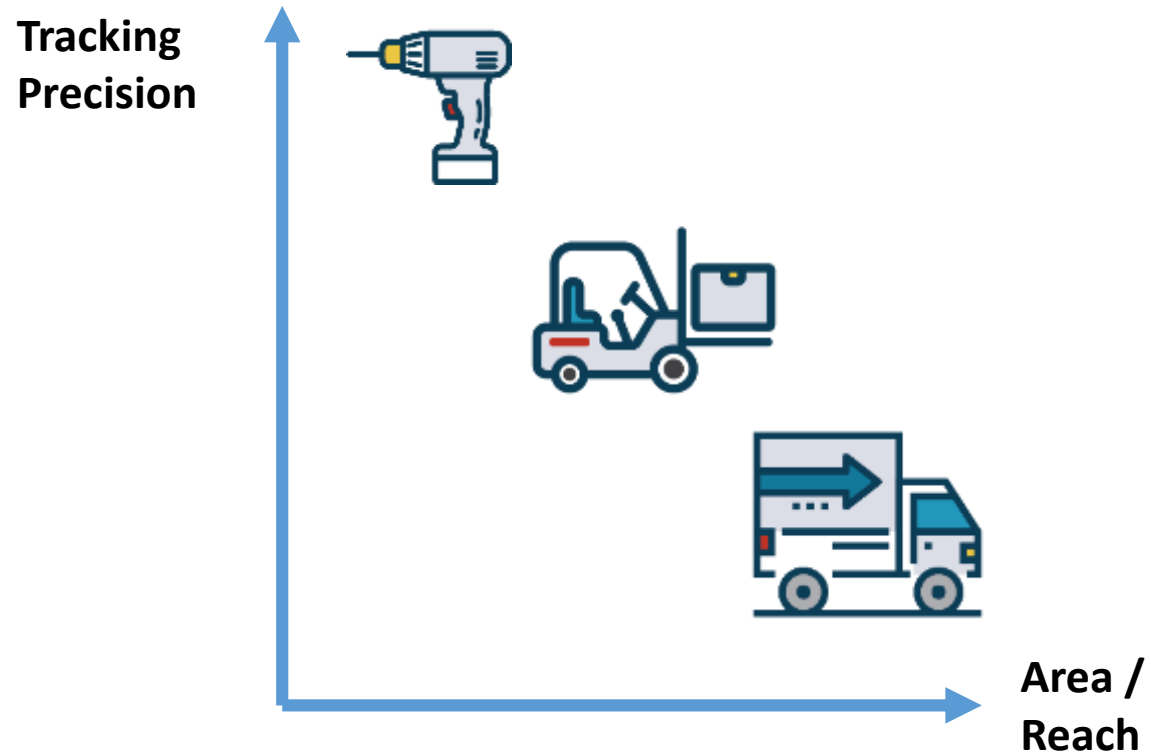
To ensure logistics and manufacturing processes can benefit from localization and usage data, optimizing process efficiency and quality

	<b>Extra-Logistics</b>	<b>Intra-Logistics</b>	<b>Manufacturing</b>
● <b>Tracking</b>	Estimated Time of Arrival	Support Kanban workflows	Use tools with specific configuration/set-up only in designated work cells
● <b>Tracing</b>	Ensure fragile and sensitive products are handled properly	Heat map to optimize forklift usage	Easily detect process deviations





# Challenges and Solutions – Different Tracking Requirements





# What problems do we address?

---

## Transparency along the entire value chain

Ensure the right data is available in logistics and manufacturing

## Integration with many partners

In a factory setting, there are many asset types, suppliers and backend systems to integrate

## Don't miss the big picture

Improving utilization and optimizing the usage of equipment is not possible without the data





# The Solution - Tracking

---

Gather data from the assets or sensors on transport items, trucks, forklifts and industrial equipment to accurately track them, via a comprehensive user interface, in industrial factory, maintenance and logistics environments.

- **Transport Items and Vehicles**

Track transport items and transport vehicles, e.g. within geo fences

- **Forklifts**

Heat maps are created; Beacons with triangulation provide data on localization, movements and geo fence violations – maximizing efficiency

- **Power tools**

Location information ensures each tool is used only in its designated locale

- **Influencing Standards**

Identified standardization opportunities around localization technology and enterprise system interfaces; data models, data communications and device management







# The Solution - Tracing

---

Gather data from the assets or sensors on tools and forklifts to accurately trace them in industrial factory, maintenance and logistics environments.

- **Transport Items and Vehicles**

Sensor data to ensure proper handling of sensitive and fragile objects

- **Forklifts**

Use sensor data to ascertaining loads – achieve process optimization

- **Power tools**

Process information ensures tools are used with specified parameters

- **Influencing Standards**

Exploring standardization opportunities around tightening tool, load management and enterprise system interfaces





# Progress Report

---



- Finalize basic tracing solution implementation
- Document findings
- Focus on Go-to-Market

- Expand into forklift tracking with new partners
- Initial RFI for indoor localization completed

- Standardization of interfaces for localization of tools, including geo-fencing
- Device management requirements sent to OMG
- Power tool findings sent to Eclipse Foundation for open-source availability

- Expanding to extra-logistics, tracking and tracing for transport items and transport vehicles





# The Teams

---

Extra Logistics



**BOSCH**

Forklifts



**BOSCH**

Power Tools




**BOSCH**



**Tech  
Mahindra**





# What's next?

---

## Key Activities

Continue the rollout to additional forklifts

Improve the APIs for deeper integration with Zenoway and SAP VehicleInsights

Update deliverable documents

Pre-sales activities to launch PoC with customers

Continue standardization activities

Explore new track & trace application areas, leveraging AI/ML and blockchain in logistics

**Have questions about this testbed?**

Send an email to  
[info@iiconsortium.org](mailto:info@iiconsortium.org)







Power Tools quote: “Geft urna mollis ornare vel eu leo. Sed posuere consectetur est at lobortis. Maecenas faucibus mollis interdum.”

Forklift quote: “Geft urna mollis ornare vel eu leo. Sed posuere consectetur est at lobortis. Maecenas faucibus mollis interdum.”

# Track & Trace Testbed



## The Problem

Optimize equipment location and load, ensure the proper usage and minimize failures of handheld power tools and forklifts to improve the overall manufacturing process.

## Our Solution

Gather and analyze data from assets or sensors on the assets to accurately track and trace them in industrial factory, maintenance, and logistics environments.

## Key Benefits

- Improve Asset & Work Management
- Integrate with Factory Manufacturing Systems
- Improve Safety and Operational Performance
- Ensure Process Quality
- Optimized Processes
- Maximize Efficiency

## Teams

- Power Tools:
  - Bosch
  - Tech Mahindra
  - Cisco
- Forklifts:
  - Bosch
  - SAP SE



# INDUSTRIAL INTERNET CONSORTIUM

## USE OF INFORMATION - TERMS, CONDITIONS & NOTICES

---

### **Authors and legal notice**

Copyright © 2018 Industrial Internet Consortium. All rights reserved. This document is provided AS-IS and WITHOUT WARRANTIES.

All copying, distribution and use are subject to the limited License, Permission, Disclaimer and other terms stated in the Industrial Internet Consortium Use of Information – Terms, Conditions & Notices, as posted at [www.iiconsortium.org/legal](http://www.iiconsortium.org/legal). If you do not accept these Terms, you are not permitted to use the document.

