Tyre Identification & Traceability Using RAIN RFID

ID Tech Solutions Pvt. Ltd.

PRESENTATION OUTLINE

❑ About ID Tech

❑ RFID Tyre Identification Solution

❑ ISO-based standardization

❑ 3 Types of RFID Tyre Tags

❑ Tag Data Format

❑ Various Solutions

❑ Key Hardware Components

❑ Successful Case Studies

ID Tech Solutions Pvt. Ltd.

About Us

ID Tech Solutions Private Limited an **ISO 9001:2015** certified company formerly known as **ID Solutions was founded in April 2004** to cater to the needs of Plastic Cards and Smart Cards in the Indian subcontinent.

We are the leaders in the "next generation" of Smart Cards, Plastic Cards, RFID products, Card Printers, Handheld Devices, Time Recorders, Entrance Automation Products Access Control Systems, IT and other customized solutions.

Over the past 19 years, we have grown from a company primarily providing plastic cards to **Smart Cards, RFID products, Entrance Automation Products, Track & Trace Solution & Services**, one with the capability, experience, and expertise to provide customized electronic security management focused solutions and services.

Our experience and strong mission-first work ethic has helped us develop capabilities, insights, and skills that few, system integrators can match.

1ST RFID TAG MANUFACTURER IN INDIA APPROVED FOR MAJOR GOVERNMENT INITIATIVES

Ministry Of Finance

RFID E-Seals
CBIC Approved

For Exporters

Ministry Of Railways

RFID Wagon Tags
RDSO Approved

For Wagons & Coaches

Ministry of Road Transport and Highways

RFID FasTags
ARAI Approved

For Vehicles

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1ST RFID TAG MANUFACTURER IN INDIA APPROVED FOR MAJOR GOVERNMENT INITIATIVES

JV of NICDC & NEC

RFID UHF Reader with Antenna & RFID UHF Tag

For Container Tracking

Delhi Metro Rail Corporation

FASTag based & Contact Less Parking System

For Contactless Parking
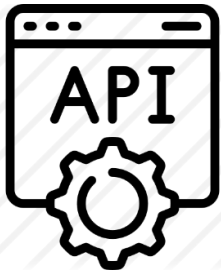
360°RFID Solution Provider

Hardware

- ❖ RFID Tags
- ❖ RFID Labels
- ❖ RFID Readers
- ❖ RFID Antennas
- ❖ RFID Printers

Training

- ❖ Solutions Architecture
- ❖ Installation
- ❖ Hardware Selection
- ❖ POC

Software

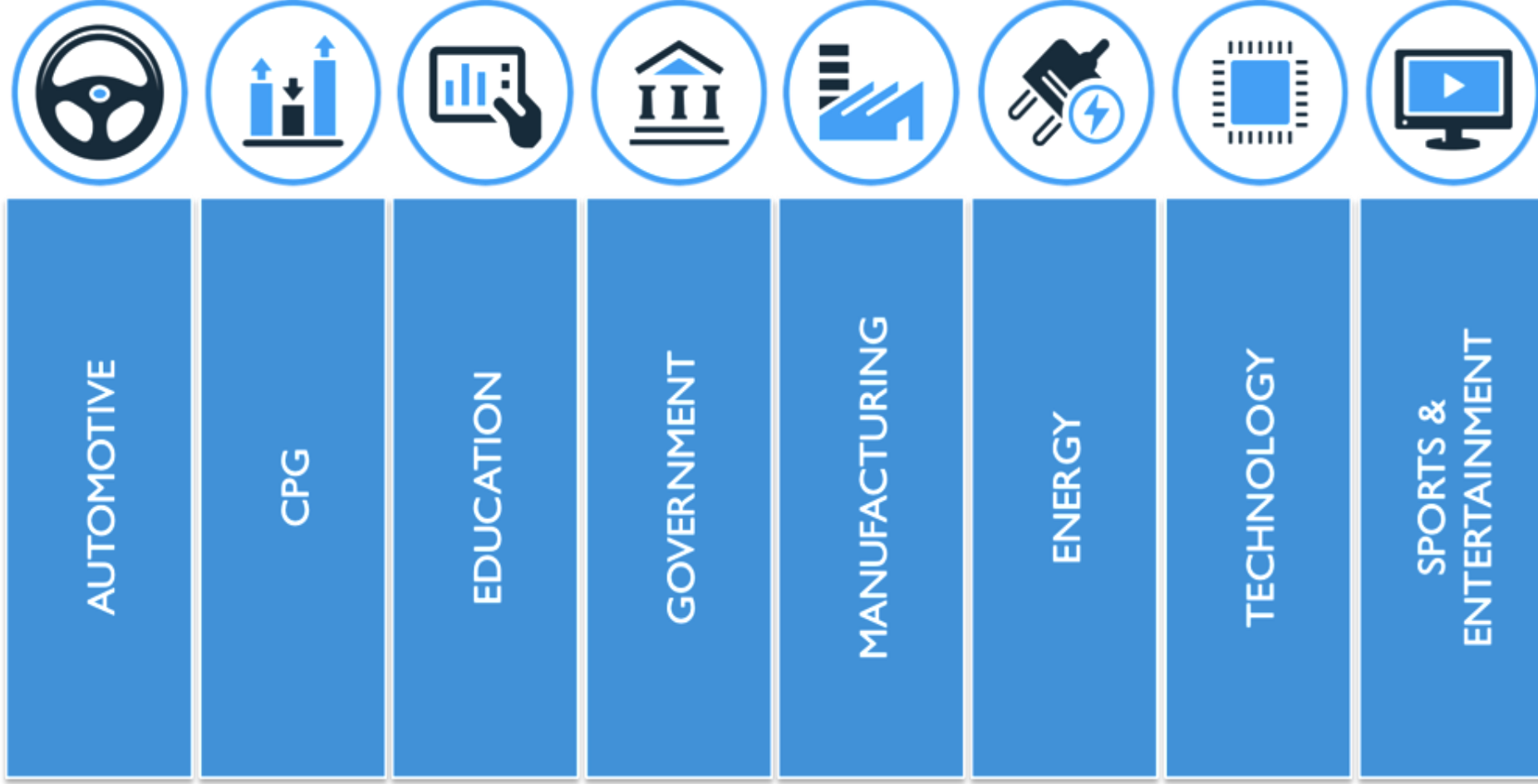- ❖ Asset Management
- ❖ Inventory Tracking
- ❖ WMS
- ❖ RTLS

Support

- ❖ Technical Support
- ❖ Warranty Spare management
- ❖ Extended Warranty Contracts
- ❖ AMCs/CMCs

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Business Verticals

AUTOMOTIVE

CPG

EDUCATION

GOVERNMENT

MANUFACTURING

ENERGY

TECHNOLOGY

SPORTS & ENTERTAINMENT
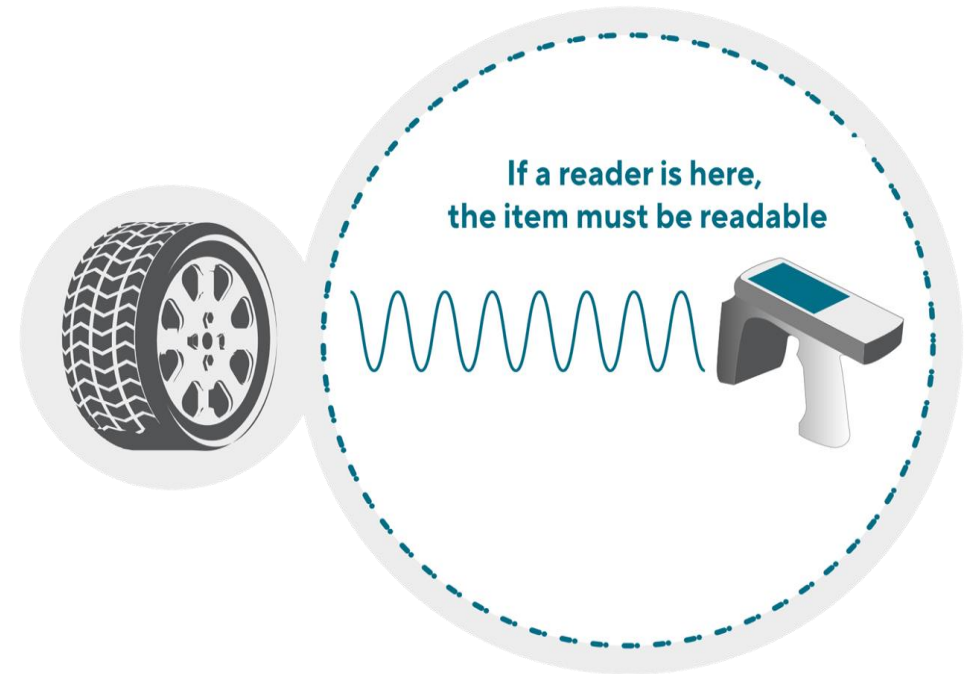
RFID Tyre Identification

RFID technology improves traceability, efficiency and safety throughout the tyre lifecycle including recycling. It is now recognised as the market standard.

ID Tech provides a comprehensive RFID Solution tailored for the Tyre Industry, encompassing **RFID Tyre Tags, RFID Readers (manufactured in India), and a Software Solution.**

If a reader is here, the item must be readable

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Various Entitites Utilizing: RFID Tire Identification

Tire Manufacturers

- Manufacturing Process
- Inventory
- Logistics

Vehicle Makers / OEM

- Part Conformance
- Part Traceability

Tire Dealers

- Product Info.
- Order To Sale
- Inventory
- Claim Management

End Users

- Product Information
- Customer Experience

Tire Retreaders

- Casing Ownership
- Casing History Management

Vehicle Fleets

- Tire Asset Management

Tire Recycling

- Product
- Content Identification
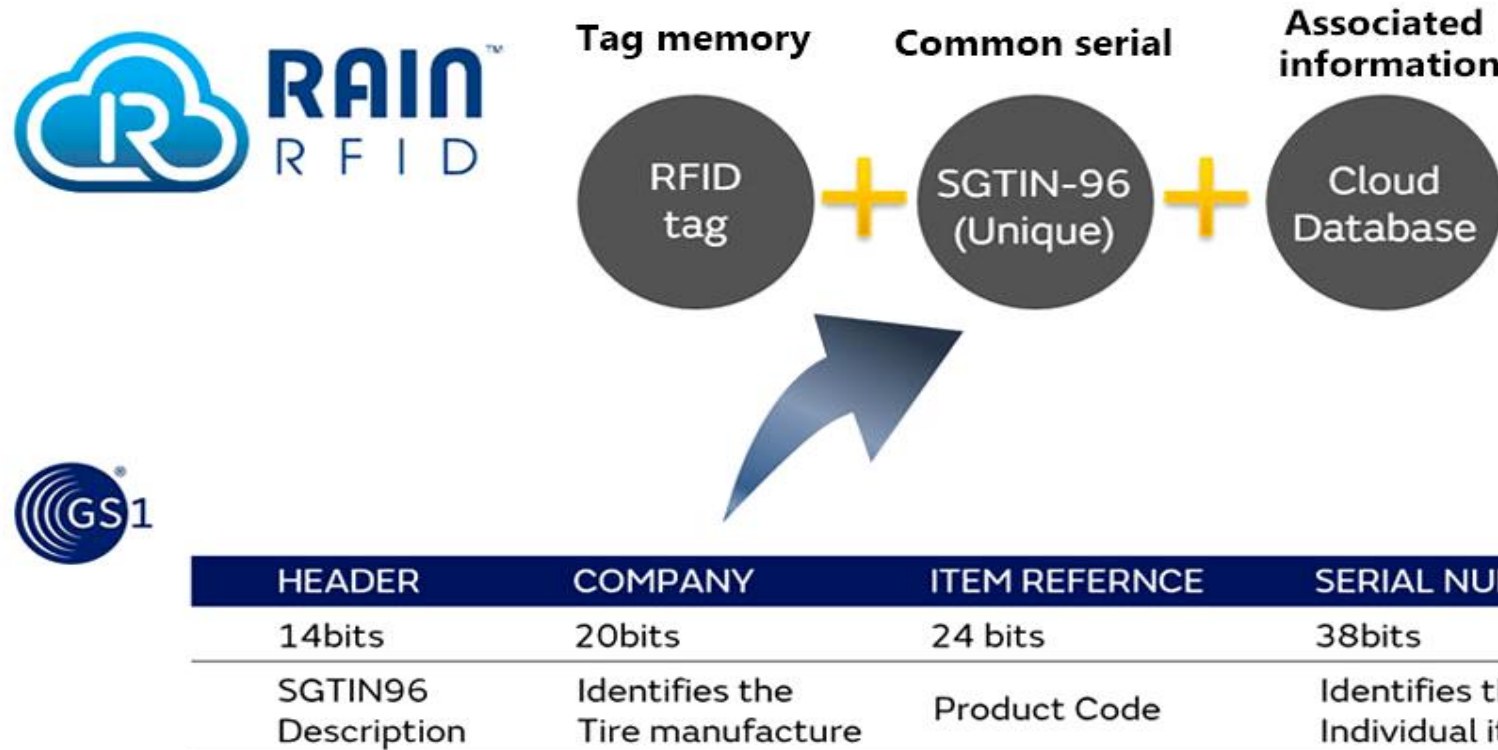
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ISO-based standardization

International Organization for Standardization (ISO):

a. ISO 29160: Information technology - Radio frequency identification for item management - RFID Emblem

b. ISO 20909: Radio frequency identification (RFID) tyre tags

c. ISO 20910: Coding for radio frequency identification (RFID) tyre tags

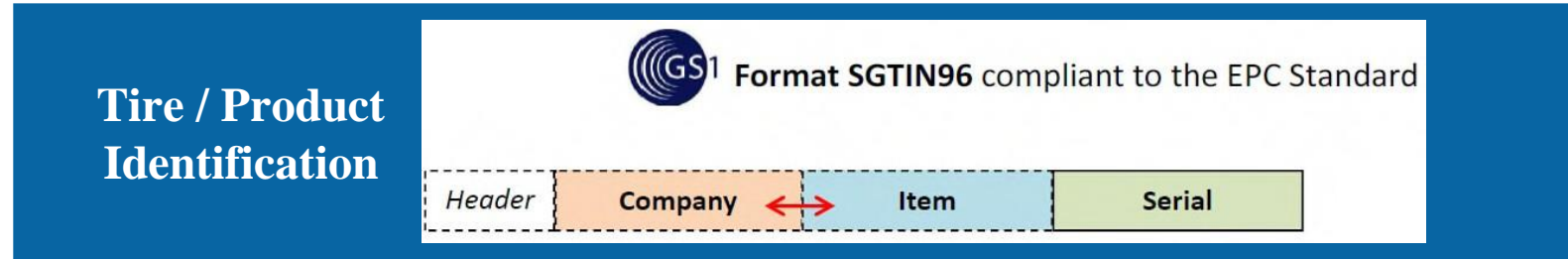**d. ISO 20911:** Radio frequency identification (RFID) tyre tags - Tyre attachment classification

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Tag Data format

Tag memory + **Common serial** + **Associated information**

RFID tag + SGTIN-96 (Unique) + Cloud Database

HEADER	COMPANY	ITEM REFERNCE	SERIAL NUMBER
14bits	20bits	24 bits	38bits
SGTIN96 Description	Identifies the Tire manufacture	Product Code	Identifies the Individual item

A tyre tag RFIDcontains the tyre's unique identifier. This is the original unique identifier of the tyre, based on the SGTIN-96 format, which includes the company prefix number, item code and unique manufacturing serial number. The RFID tags inserted in tyres comply with the international standards ISO 20909 and ISO 20910.

Tag Data Encoding

Tire / Product Identification — GS1 Format SGTIN96 compliant to the EPC Standard

Header | Company ←→ Item | Serial

There are two key "on tag" memory areas used for storing data.

1. Tag IDentification (TID): The first area contains standardized read only data.

1. Electronic Product Code (EPC): The second area is read and write capable and may contain user or manufacturer-defined data.

Accessible Information:
An RFID scanner that reads the RFID tag embedded in the tyre automatically accesses the tyre's commercial designation (size, brand, range). This is the basic standard service provided by the tyre industry. Any other information related to the RFID of the tyre is subject to the prior permission of the tyre user.

RFID TYRE TAGS ATTACHMENT

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RFID TIRE SPRING TAG

This tag is developed to be embedded within the tire during the manufacturing process.

It lasts the lifetime of the tire.

With unique identification number can be tracked to across different process.

Its advantage is small size, resist at least 200°C,etc.

RFID TIRE PATCH TAG

Tag developed to track finished tire, with unique identification number to prevent tire theft and cloning.

It lasts the lifetime of the tire.

Attached inside the sidewall of the tire with vulcanizing agent.

Mainly used for Bus Tire, Truck Tire, Trailer tire etc.

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RFID TIRE STICKER TAG

For Storage at Manufactures & Dealers

RFID Labels feature a specialized high-performance adhesive meeting the toughest durability challenges of applying onto rubber surfaces.

The label features the use of a finely tuned antenna design which provides best in class read range.

Offering an ideal solution for WIP management, logistics, supply chain etc.

SOLUTIONS
Track, Trace and Validate your Tire Inventory

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Tire Labeling & Tagging Solutions for Manufacturing Logistics

Effortlessly track and manage tires throughout the production process using cutting-edge RFID technology. Enhance efficiency, reduce errors, and gain real-time insights into your tire manufacturing operations. Experience seamless integration and precision control, optimizing your entire manufacturing logistics with ease.

Benefits of tagging tires during manufacturing:

- Unique serialization
- Full process transparency
- Process automation
- Complete traceability down to an individual tire
- Quality and warranty management
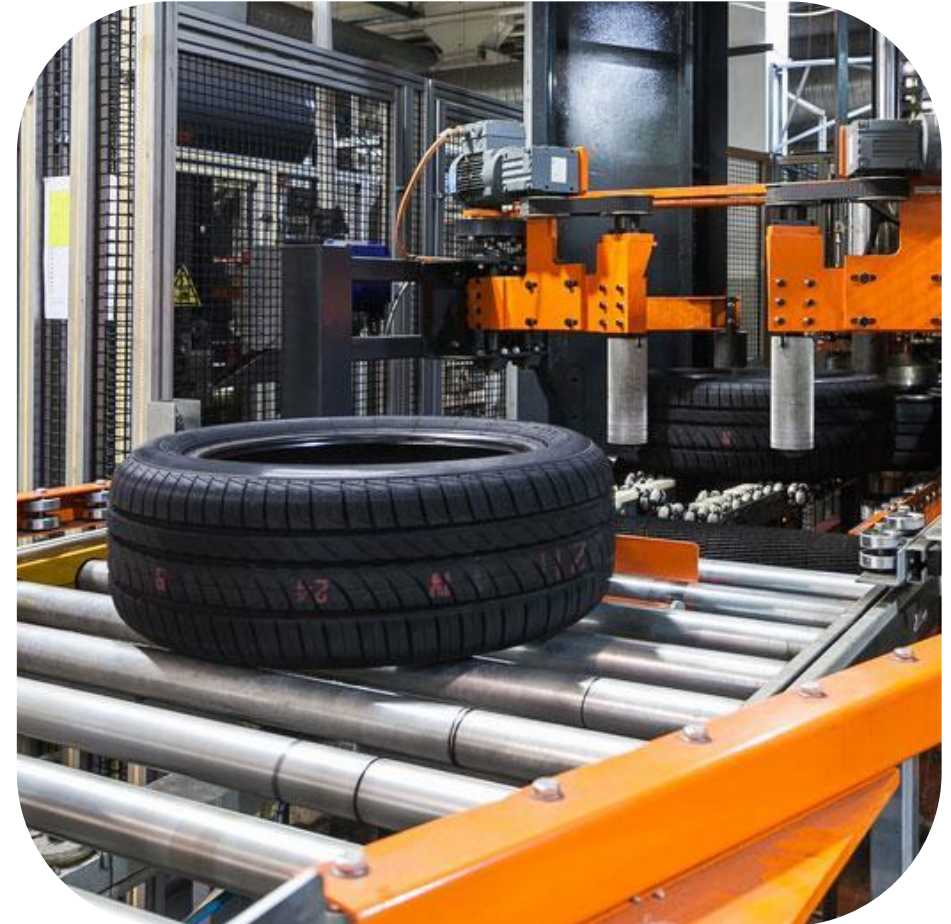
RFID Solutions for Tire Supply Chain and Inventory Management

Seamlessly track tire movement, enhance visibility, and optimize stock levels throughout the supply chain. Gain real-time insights, reduce manual errors, and boost operational efficiency, all while ensuring accurate and efficient tire inventory management.

Benefits of RFID tire labeling for supply chain and inventory management :

- Automated, efficient and accurate inventory management data collection
- Supply chain process automation
- RFID long range (up to 8 meters) and throughput (bulk scanning)
- Regulatory compliance

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Tire Tagging Solutions for Fleet Management

Efficiently monitor and manage your fleet with our RFID Tire Tagging Solutions. Seamlessly track tire information, maintenance schedules, and performance data, enhancing fleet operations and optimizing maintenance processes.

Benefits of RFID tire tagging for fleet management:

- Track individual tires for inventory management, servicing and maintenance
- Retrofit existing tires or integrate into tire during production or re-treading
- Scan tires with mobile or gateway RFID readers
- Asset management and theft detection to individual tire

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Tagging Solutions for Re-Treaders

Tire re-treaders, take advantage of a wide range of RFID solutions to uniquely identify tires through all stages of re-treading process. Using RFID technology, re-treaders gain full product lifecycle management (PLM).

Benefits of RFID tire tagging for re-treaders:

- Unique serialization down to the tire casing
- Complete traceability down to an individual tire casing
- Quality and warranty management
- Asset management of fleet tires

Tracking Solutions for Mold and Tooling Management

Identify, match and manage tire molds and other tooling to a machine, production batch, machine operator and each individual tire. Advanced tagging solutions allow for unique identification. By coupling the segments with the mold casing, it takes seconds to verify that the mold is correctly assembled and ready for manufacturing.

Benefits of RFID for Mold and Tooling Management:

- Improve process efficiency, data accuracy and transparency
- Fast and accurate locating of molds and mold parts including segments and bead rings
- One-to-one data aggregation in real time between design, mold, segments, bladder, press, operator, and tire.

RFID SOFTWARE SOLUTION

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TIRE INFORMATION SYSTEM

GOVT. AGENCY

LOGISTICS

RETREADING RECYCLING

TIRE MANUFACTURER

END USER

Tire Information System

OEM

WHOLESALER

DEALER

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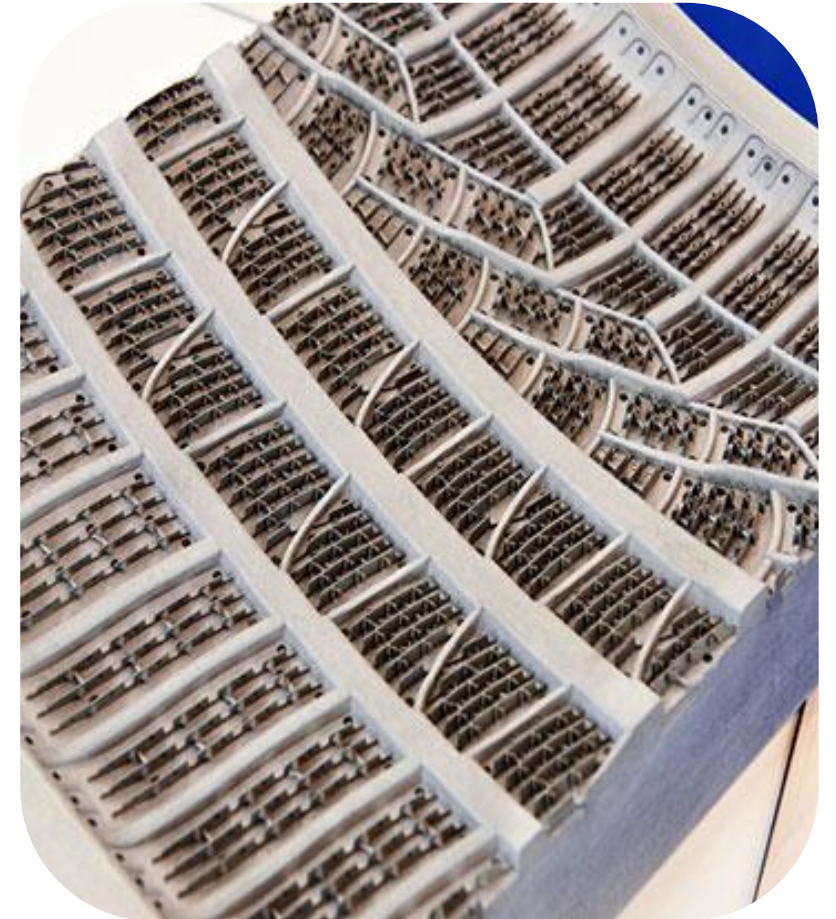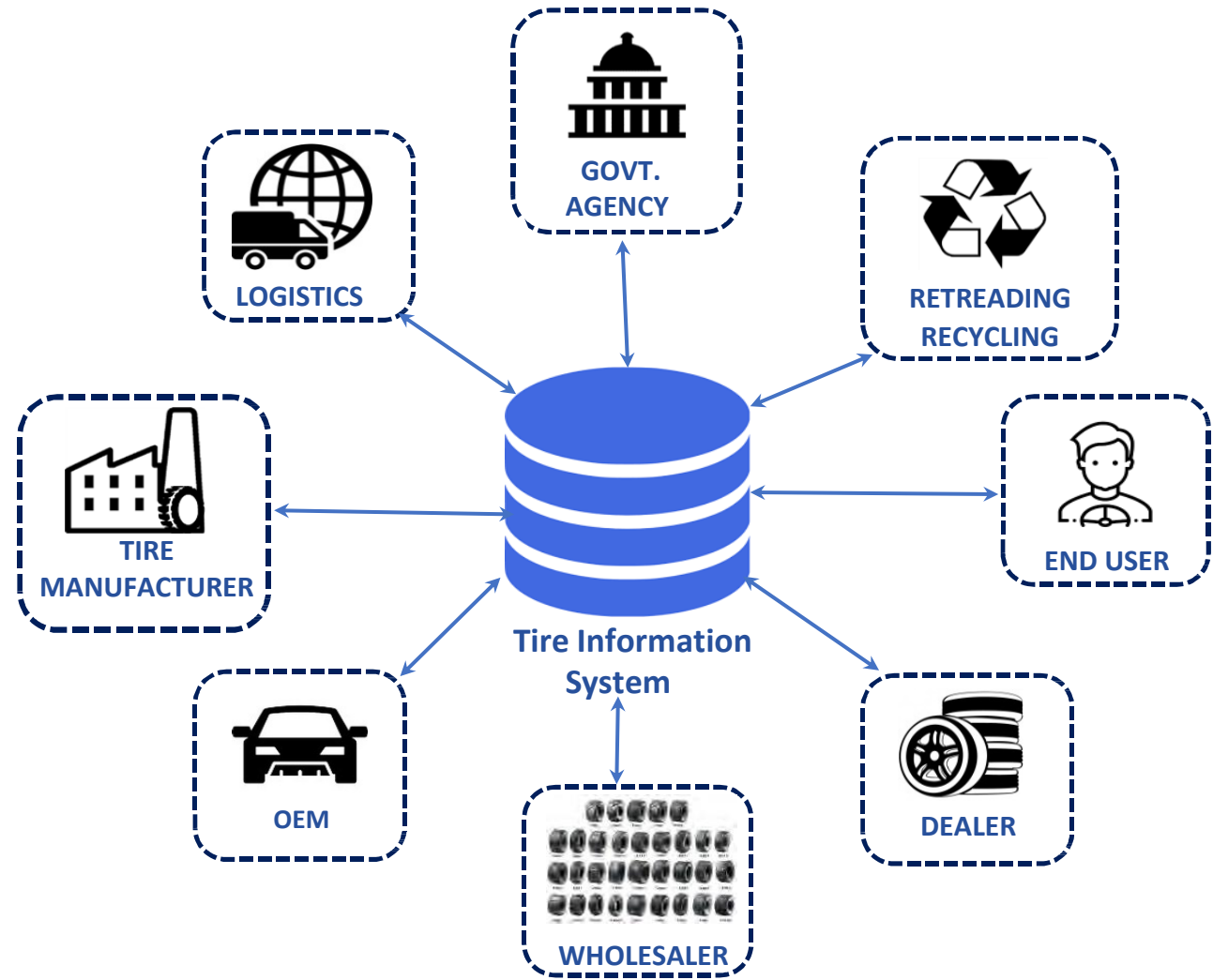
RFID Generic Architecture

EXISTING SYSTEMS
- Connect to multiple applications
- Apply business logic

WMS

AMS

MES

Web Server
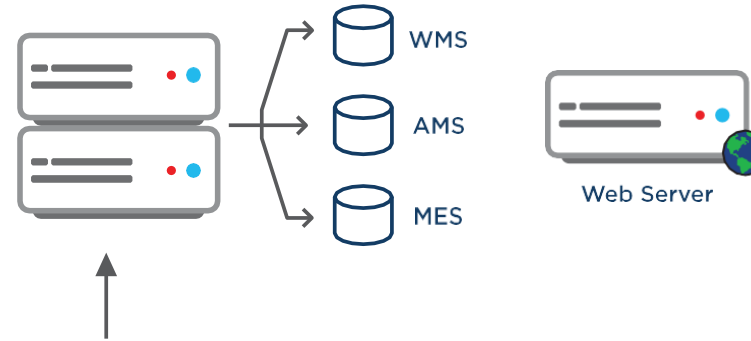
identify ▸ manage ▸ track

BUSINESS APPLICATION
- Interpret events
- Turn raw data into business process information
- Client customised application
- Data warehousing
- Modular Add On-Systems

EVENT LAYER
- Manage devices
- Register tagged items
- Log raw events
- Track & trace

INTERFACE

HOST

MIDDLEWARE

DEVICE MANAGER

GUI

ALERTS

REPORTS

SMS

MAIL

EXCEL

XML
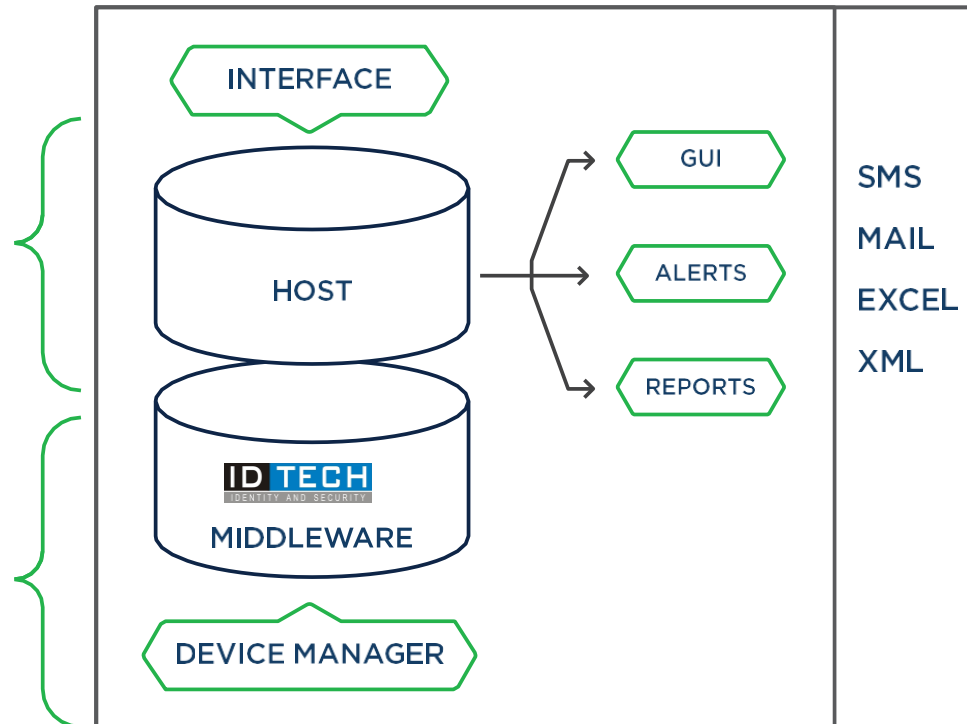
RFID Software Dashboard

Asset Registration

Report

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Key Hardware Components

RFID Tyre Tags

RFID Handheld Reader

RFID Desktop Reader

RFID Printer for Sticker Label
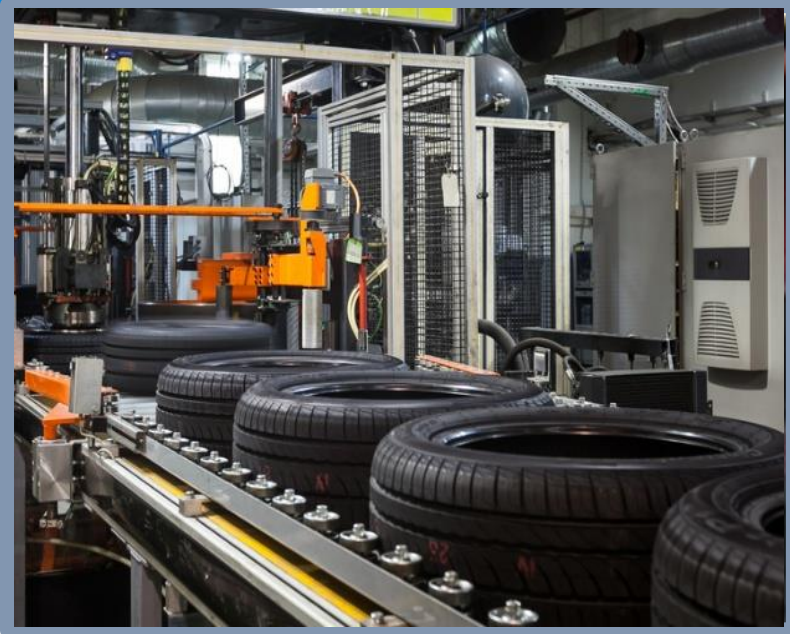
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Key Hardware Components

RFID Portal

RFID Antenna

RFID 4-Port Reader

SUCCESSFUL CASE STUDIES

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TYRE MANUFACTURER

Industry Application: Tire Management
Region: India

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OVERVIEW

Tire Manufacturers are offering tires as a service as the new business model. This involves maintaining of tires over a period of time by the manufacturers at the fleet owners premises.

THE CHALLENGE

Barcoding or existing labels bring about a lot of challenges.

Easily obscured by dirt & Scratched Stored contents are limited and contents cannot be modified

THE SOLUTION

Each RFID tag provides a unique ID and storage memory for saving useful information such as manufacturers, production date, expiry date, size, maximum inflation pressure and so on, and can be associated with the vehicle identification number. Workers manually scan multiple tires at a time and upload captured data wirelessly to the car maker's host server.

THE RESULTS

RFID technology allows to fetch all the records dating back to the manufacturing and batch no.

This allows them to use tires across different fleet owners.

This also helps in the In-plant R&D setups to identify suitable tested samples.

HARDWARE OFFERED

• RFID Handheld Readers

• RFID Wire Tags

• RFID Portals (In Plant)

AUTOMOBILE MANUFACTURER

Industry Application: Tire Inventory
Region: India

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OVERVIEW

India has been the world's largest auto market. Tire Labelling, requires that car makers closely track tires using RFID tags, so they can be recalled if there's a problem.

THE CHALLENGE

Old way to track tires is using barcode and branding, which is:

Easily obscured by dirt & Scratched Stored contents are limited and contents cannot be modified

THE SOLUTION

Each RFID tag provides a unique ID and storage memory for saving useful information such as manufacturers, production date, expiry date, size, maximum inflation pressure and so on, and can be associated with the vehicle identification number. Workers manually scan multiple tires at a time and upload captured data wirelessly to the car maker's host server.

THE RESULTS

RFID technology allows for relevant data such as, make, size, pattern, and phase, to be written and stored within the microchip. This data can be retrieved with ID Tech's scanners and used to track and record its current status and whereabouts.

HARDWARE OFFERED

- RFID Handheld Readers

- RFID Labels

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FLEET OWNER

Industry Application: Tire Maintenance & Theft Protection
Region: India

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OVERVIEW

The biggest costs for Transporters & Fleet Owners other than fuel is the tire.
Tires are like consumables for this industry and thus they need to make sure they get the ,maximum output from the same.

THE CHALLENGE

Drivers Replacing New Tyres By Old Tyres Maintaining the location of the tyres fitted onto a truck as per the decided schedule.

THE SOLUTION

Every Tire is tagged with a RFID Tyre Patch and every vehicle is tagged with an RFID Windshield Tags.

All the Tire tags are mapped with the Master Vehicle Tag.

The tags are read every time they enter and exit the vehicle yard before they start or complete their journey making sure the tyres are identified & traced at all times.

THE RESULTS

RFID technology allows for relevant data such as journey's completed, kms run and most importantly theft protection.

HARDWARE OFFERED

- RFID Handheld Readers

- RFID Tire Patch & Windshield Tag

- RFID 8 Port Readers

- RFID Circular Polarized Antenn

TIRE RETAILERS

Industry Application: Tire Inventory
Region: India

OVERVIEW

Dealers need to keep an inventory of tires based on the different car models which sometimes becomes a difficult task.

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THE CHALLENGE

Old way to track tires is using barcode and branding.

However barcode scanning for stock taking is a time taking process. Searching of a particular tyre is not possible.

THE SOLUTION

Each RFID tag provides a unique ID.

RFID Handheld Readers are used for Inventory, Search and Identify operations.

The Invoicing part is also linked with RFID tags helping the dealer to maintain a real time stock.

THE RESULTS

RFID technology helps in a faster turn around time for the dealer.

This gives more visibility to the stock and helps movement of stock on FIFO basis.

HARDWARE OFFERED

- RFID Handheld Readers
- RFID Labels

THANK YOU

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ID Tech Solutions Pvt. Ltd.