

One of the leading players in the paints and chemicals sector, faced significant operational challenges related to vehicle management within its plant premises. In response to these issues, QodeNext implemented a comprehensive hybrid technology solution leveraging RFID (Radio Frequency Identification), Bluetooth, and Barcode Technology. This solution aimed to enhance operational efficiency, minimize manual intervention, and optimize critical processes such as vehicle tracking, weighbridge management, quality control, and material handling.

The integration of these advanced technologies helped in automating and streamlining various processes, offering the business the opportunity to improve its overall plant operations while reducing costs and mitigating risks.

### **The Challenges:**

#### **Lack of Real-Time Vehicle Tracking within Plant Premises**

The company faced the challenge of inadequate real-time vehicle tracking within its plant premises. Without an automated system in place, tracking vehicles as they enter, exit, and move around the premises became a cumbersome and error-prone task. This led to inefficiencies, increased turnaround time, and difficulty in managing the flow of materials and products within the plant.

#### **Manual Processes in Weighbridge and Quality Control**

The company's weighbridge and quality control processes are still largely manual. This resulted in errors in data entry, delays in processing, and an increased risk of inaccuracies, affecting operational efficiency and product quality. The lack of automation increased dependency on human intervention, leading to a higher likelihood of mistakes.

#### **Pilferage and Malpractice Risks Due to Lack of Automated Tracking**

The absence of automated tracking created an environment where pilferage and malpractice can occur. Without a real-time monitoring system, tracking the movement of materials and ensuring proper quality control becomes difficult, leading to potential financial losses and compromised product integrity.

#### **No Clear Driver Guidance, Causing Delays in Processing**

One of the key issues at Grasim Industries is the lack of clear guidance for drivers within the plant. Drivers are often unsure about where to park, how to navigate the premises, or the correct sequence of actions to take during the unloading process. This results in delays, inefficiencies, and potential bottlenecks.

#### **Ambiguous Truck-Weighing Data Due to Manual Correlation**

The truck-weighing process is another area where manual processes lead to inefficiencies. The need for manual correlation of data from various sources leads to ambiguities in truck-weighing information, causing delays and potentially incorrect data for operational planning and decision-making.

#### **Incorrect Material Dumping into Wrong Storage Silos**

Grasim Industries faces challenges in ensuring that materials are correctly dumped into the appropriate storage silos. The risk of incorrect material dumping due to human error or lack of tracking leads to significant financial and operational losses, as it disrupts the production process and leads to the need for costly corrective actions.

### **The QodeNext Solution:**

To address these challenges, QodeNext implemented a hybrid technology solution integrating RFID, Bluetooth, and Barcode Technology to create a comprehensive Vehicle Management System (VMS). This solution automated key operations, improved tracking, and increased overall operational efficiency. Below is an overview of the implemented technology stack and key features of the VMS:

#### **Technology Stack:**

**RFID & Bluetooth:** RFID tags on vehicles and Bluetooth beacons enabled the system to track the precise location of each vehicle as it moves through various stages.

**Barcode Technology:** It was used for accurate quality sampling during inspections, ensuring that products are monitored and verified with precision at each stage.

### Key Features of the Vehicle Management System (VMS):

#### Real-Time Vehicle Tracking:

The VMS provided a virtual map with color-coded vehicles to allow real-time tracking of all incoming and outgoing vehicles.

#### Optimized Parking Management:

The system monitored truck counts, enabled dynamic parking management through zoning and optimizing parking space utilization.

#### Automation of Weighbridge & Quality Control:

Weighbridge operations were fully automated, reducing manual labor and eliminating human errors. Quality control processes were streamlined, ensuring consistent and accurate monitoring.

#### Stage-Wise Turnaround Time (TAT) Data Collection:

The system tracked the time taken at each stage of the vehicle process, providing detailed insights into bottlenecks and opportunities for further optimization.

#### Bay Utilization Optimization:

The VMS optimized bay utilization by providing real-time data on available bays and managing the allocation efficiently.

#### Automated Gate Process:

The introduction of automated gate processes reduced manpower requirements, eliminated queues, and sped up vehicle entry and exit.

#### Truck-to-Route and Truck-to-Tank Mapping:

This feature mapped trucks to specific routes and storage tanks, ensuring that materials are always delivered to the correct location and preventing material mix-ups.

### Solution Impact:

By implementing QodeNext's implemented solution, the company had the following business benefits:

#### Enhanced Operational Efficiency:

It significantly improved overall operational efficiency. This resulted in faster turnaround times, better resource utilization, and reduced manual intervention.

#### Reduction in Pilferage & Malpractices:

Real-time tracking and automated monitoring systems helped mitigate the risks of pilferage and malpractice, ensuring that materials are correctly handled and processed.

#### Improved Truck Movement Visibility:

Real-time visibility into truck movement reduced delays and provided actionable data for optimizing workflows, ultimately reducing turnaround time.

#### Minimized Risk of Material Misplacement:

With automated material tracking and truck-to-route mapping, the company minimized the risk of materials being placed in the wrong storage silos, which further reduced financial and operational losses.

#### Reduced Manpower Dependency:

Automation of gate processes and vehicle tracking reduced the dependency on manual labor, improving efficiency and allowing personnel to focus on higher-value tasks.