Global cement manufacturing company deploys a RFID-enabled TRUCK MOVEMENT OPTIMIZATION SYSTEM

Automated time optimization in truck loading and allotment of dispatch
Efficient queue management and dispatch alerts
Data integration of loading and weighbridge operations
Real-time tracking of truck movement in transit

TECHNOLOGY
Solution:
EPC Gen2 compliant vehicle tracking and time-optimization solution
Tag Type:
Parka™ UHF Passive
Reader/Antenna:
Xtenna™
Xtenna Hybrid™
Method:
Multiple Tracking via Integrated Reader/Antenna modules
Integration Platform:
RFID Middleware:
Xtenna™ WebToolkit
Xtenna™ Studio
Application:
Essen RFID’s Truck Movement Optimization System
Database:
SQL Server 2005 Exp. ed.
ERP:
SAP
Process Integration:
SAP PI
Tag Manufacturer/Supplier:
Essen RFID, with US based chip inlay
Reader/Antenna Manufacturer:
Essen RFID, with US based module
Systems Integrator:
Essen RFID

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CASE STUDY

KEY REQUIREMENTS:
Holcim is a global cement manufacturing company, with an increasing presence in India. At its India units, the company transports cement using its own trucks as well as trucks operating on contract. Its key requirement in this process is that of managing the vehicles efficiently at the loading point and dispatching the trucks to multiple warehouses/depots.

Trucks are loaded with cement bags each day at the unit’s loading bay. Loading each truck takes at least 30 minutes, during which time all other trucks also congest the loading area. This unregulated traffic movement creates a risk of improper loading, further delays, wrong dispatches, mistakes and injuries to people. The company also needed to track its own trucks in transit in order to prevent wilful delay and ensure cost efficiency. To prevent time wastage and inefficiency, and to streamline goods dispatch, Holcim needed a Truck Movement Optimization System which would manage vehicles efficiently and save time involved in the entire process.

Main challenges in implementation:
• Managing vehicle queues efficiently.
• Sending alerts to truck drivers when the next loading bay would be free for loading the cement bags.
• Assigning a particular trip to a truck according to its immediate availability at the loading bay, based on prompt response by drivers to alerts sent to them.
• Calculation of tare weight, gross weight and net weight of assigned truck.
• Calculating the weight of the truck at destination and checking the difference, thereby holding truck driver responsible if weighment is found to be less at the destination site.
• Tracking company-owned trucks in transit from the manufacturing unit to the depots in order to prevent wilful delays, unscheduled halts and time wastage, and thereby ensure efficient and cost-effective dispatch of goods.

SOLUTION:
Essen RFID offered a solution that enabled the company to efficiently manage vehicle queuing and task assignment to truck drivers through its Truck Movement Optimization System. Trips are allotted automatically based on immediate truck availability at the loading bay through alerts sent to drivers and their prompt response, thus preventing non-productive hold-ups during loading. Each trip is automatically generated when the tagged truck is detected through RFID at loading and completed when its tag is read at the destination. Real-time mapping data from company-owned trucks is uploaded to the central server via GPRS.
IMPLEMENTATION:

Xtenna™ antenna-readers are mounted at the entry/exit gates of the parking area and also at the entry/exit of the loading area. Xtenna™ is installed at the weighbridge where tare weight is calculated. Xtenna Hybrid™ are mounted as portals at each loading bay where cement bags are loaded onto the trucks, while another Xtenna™ is installed at the other weighbridge where gross weight is calculated after loading. A Xtenna™ is also fitted at each destination depot where goods received are calculated and compared with dispatch data.

Each truck has a PARKA™ RFID tag fixed to it on the left side of the windshield. Company-owned trucks are also fitted with a GPS device. SQL Server is used as the database, which also sends all data to SAP, the ERP used by the company.

WORKING:

The company has a large parking area for trucks and another area containing the loading bays where the trucks are loaded with the cement bags. The truck movement is as follows:

Process Flow:

1. A PARKA™ RFID tag is affixed to the windshield of each truck, company-owned as well as trucks on contract. Company-owned trucks are also fitted with a GPS tracking device.
2. The tags are registered in the database to the respective trucks along with truck details, driver details and owner details (in case of contracted trucks).
3. When a truck enters the parking area, the Xtenna™ antenna-reader mounted at the entry gate reads the PARKA™ tag and logs the time into the system.
4. Inside the parking area, many trucks are parked awaiting their turn to be allotted with dispatch trips. The Truck Movement Optimization System is deployed to streamline this allotment process. When a loading bay becomes available for the next truck, a signal is sent to the dispatch office in the parking area. The dispatch office sends an alert to the first truck in the parking area based on its time logged in at the entry gate.

5. The truck driver of this truck has to promptly respond to the alert indicating his immediate readiness to proceed to the loading bay. In case the truck driver does not respond due to any reason, the alert is sent to the next truck and the same process is followed. This is to ensure that no time is wasted waiting for a truck to proceed for loading and that it does not hold up the movement of other trucks.

6. The truck driver who has responded to the alert is assigned the trip to be made and given the loading bay number where he has to load the truck. The truck leaves the parking area and the Xtenna™ mounted at the exit gate reads the tag and logs the time.

7. The vehicle then enters the loading area. Its tag is detected at the entrance by a Xtenna™ at the gate and the time logged into the system.

8. The truck moves to the weighbridge where a Xtenna™ mounted at the weighbridge detects the truck’s tag, captures its tare weight and updates the system database.
9. The truck then goes to the loading bay that has been assigned to it. The PARKA™ tag on the truck is detected by the Xtenna Hybrid™ mounted on the portal and a signal light turns ‘Green’. When loading of cement bags is completed, the truck comes out of the loading bay and the signal light turns ‘Red’, indicating to the administrator in the dispatch office that this loading bay is vacant and the next vehicle can be sent for loading.

10. The loaded truck then moves to another weighbridge on the other side of the loading bay. Here another Xtenna™ detects the truck’s tag and captures the gross weight. The system automatically calculates the net weight by deducting the tare weight captured before loading. The net weight is assigned to the truck’s tag and the dispatch trip is generated.

11. Once weighment is calculated, the truck driver collects the documentation for the trip at the adjoining kiosk and leaves from the exit gate. The Xtenna™ mounted here reads the truck’s tag and logs the time.

12. The loaded truck arrives at the depot. Here a Xtenna™ detects the truck’s PARKA™ tag and reads its details, including the weight data. A weighbridge again captures the truck’s weight and compares the destination weight with the dispatch weight. If there is a difference in net weight beyond tolerable limit, the truck driver is held accountable.

13. The cement bags are unloaded and the trip is completed. The truck can then return back to the manufacturing unit parking area for another round of goods dispatch.

14. Company-owned trucks are also tracked in transit through GPS devices fitted on the trucks. The truck’s exit time at the loading area is already logged into the system. Real-time mapping data is available to the system via GPRS, which indicates the truck’s actual position at any given time along the dispatch route. Therefore, any delays, diversions, unscheduled halts or time wastage can be monitored and action taken against the truck driver. When the truck reaches the depot, its arrival time is logged in by the Xtenna™ installed there. Similarly the return trip can also be monitored. This ensures efficient time management and cost-effective utilization of the company’s vehicles.
Real-time mapping of GPS data

**BENEFITS:**

- Optimization of time utilized in allotting loading and dispatch trip to trucks.
- Efficient assigning of dispatch trips to truck drivers.
- Efficient management of parking area queuing. The dispatch allotment is through FIFO, but alert system ensures readiness else the truck will lose its turn for loading and dispatch.
- Automated alert through signal light if a loading bay is vacant.
- Increase in employee safety due to streamlined operations.
- Automated weighbridge operations capture data into the system.
- Easy identification of theft of goods in transit if there is difference in net weight after loading and on delivery.
- Reduction in manual work and paper work due to increased automation of work process.
- In-transit tracking and monitoring of company’s trucks enables prevention of delays and time wasting to ensure efficient dispatch and optimum usage of company’s vehicles.
- Data of dispatch efficiency of company’s trucks can be utilized to encourage improved performance from contracted trucks.
CASE STUDY

LINKS:

Hardware:

Xtenna™

Xtenna Hybrid™

Tags:

PARKA™

Software:

Xtenna WebToolkit™

Xtenna Studio™

Reference Example:

http://www.essenrfid.com/Mailer/accessparking-flash-demo.pdf