Whitepaper
Automated Tracking Solution
Authors: Amit Mehetre & Nilesh Pawar
The volume of Market fleets is generally higher compared to Dedicated fleets to optimize the utilization and operational expenses. In such operational model, tracking of fleets depends on fleets having on-boarding diagnostic devices (OBD). While most of the dedicated fleets had it, market fleets did not come with any tracking capabilities thus requiring manual management of their operations through carrier at respective Plants or Terminals.
1 Executive Summary

Telematics-based logistics systems are hardware-intensive, making them unwieldy to operate in large scale due to high CapEx. These solutions fail to match the exponential advancement in other technologies, and need a paradigm shift in the logistic business, with a technology-adaptive solution. Moreover, multiple solutions are available in isolation, catering to various aspects of supply chain optimization, digitization and monitoring. Broadly, these solutions will cater to either of these - Shipment Tracking or Fleet Health & Utilization, or Route Planning, or Driving Behavior. Most of these solutions come from multiple OEMs, with integration and customization limitations thus leaving customers with multiple channels to manage their fleet.

LTI’s Automated Tracking Solution (ATS) is an end-to-end solution that fuses innovation with agility and precision, as required by logistic operations, and enables organizations to achieve high performance. The platform offers a cloud solution that can be seamlessly integrated with existing backend and OEM system for an enterprise thus giving a single platform for managing all fleet operations at one place efficiently.

ATS, Fleet Management System, is an uberized model for the logistic and trucking industry, which delivers real-time visibility over tracking, along with E-Proof of Delivery. The solution intends to provide an efficient platform for governing the drivers and fleets safety, as well as for optimizing utilization of the fleets.

This whitepaper details how the logistics operations for a Cement customer around fleet utilization and monitoring were optimized while giving them the flexibility to onboard their existing OEM solutions onto a single platform and bring a new software driven solution for fleet tracking. It also talks about how the existing platform can possibly be extended to digitize other aspects or common problems in Supply Chain industry.

Business Processes

A typical business process for logistic shipment happens either by Direct Sales to customer and dealer or by Stock Transfer to plant or terminal or warehouse. In Direct sales the goods are shipped to customer. A single sales order may have one or more delivery orders for multiple customers or ship to locations. Similarly, in Stock Transfer goods are moved within the company from one plant/terminal to another.

Once the Delivery Order is created, the same is pushed to Carriers for deliveries. The allocation of the Delivery Orders to respective fleets happens based on the fleet availability at respective Plant or Terminal.

The fleets providing the transportation services belong to one of the below segments.

- Dedicated Fleets – owned fleets
- Market Fleets – rental fleets

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2 Business Challenges

After analyzing the pain area of one of the Leading Cement Manufacturers - a Fortune 500 customer, the major challenges that surfaced were:

- Hired Trucks
- Repair / Replacement
- Storage Capabilities, Offline Mode
- Standard Configuration / Data Capture
- Route Deviations - Pilferage & Possible Theft of Goods, ETA
- Delay in Reporting Accidents
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Additionally, the current GPS implementation was not scalable due to high capex investment. Around 20% of GPS devices were not functional or were inconsistent at any given point of time leading to significant data loss for deliveries. Any enhancement’s on existing devices and application was not possible as both hardware and software are tightly coupled. The support response to repair and swap a devices was very slow (takes minimum 7-10 days).

The lack of real time insights availability on fleet movement and utilization limited the plant managers to take corrective actions in timely manner to optimize the operations and delivery compliances resulting into customer dissatisfaction and loss of business.

3 Solution Overview

To arrive at a solution a design thinking led approach was applied. The solution challenged the basic assumptions of why tracking had to be performed with a traditional hardware based OBD device.

The solution identified was a software driven approach that revolves around implementing a la “Uber Taxi” model to fleet management challenges. The solution was planned in two parts – an application that can be deployed on a mobile phone and predictive analytics algorithm at the backend. The platform designed was a cloud based technology agnostic platform that aggregated information from existing OBD devices, Mobile devices, ERP and Order planning systems to give real time insights on fleets where about with exception based alerts on safety KPIs and also includes additional capability such as e-pod to supplement OTIF (on time in full) calculations. This innovation was also expected to support the future digitization strategy for Supply Chain and Logistic space.
The solution implemented focused on below listed features

- Integrating existing OEM solutions for fleet tracking
- Onboarding new Fleets Tracking through mobile phones
- Capturing Safety KPIs like Harsh Driving, Over Speeding, Night Driving and more.
- Live Tracking (Map View) of active trips having single or multiple deliveries
- Real time alerts through Email, SMS and notifications
- Trip playback (Map View) for closed/completed trips
- Live e-Proof of Delivery Status and Delivery Order Tracking. E-POD via SMS OTP
- Analytical Report on Trip Safety, Driver Rating, Route Deviations, Trip Non-Compliance
- Easy Accessibility of portal over mobile/desktop

Architecture

Below shown is architecture of the cloud based Fleet Management platform and integration points with existing IT landscape.
ERP and Order Planning Integration:
- The platform exposed pre-defined set of APIs for easy integration with backend systems and ERPs for fetching order details and updating the same on trip closures.
- The APIs designed were generic with master list of parameters to support any ERP and OEM integration seamlessly.

System Integration:
- Existing OEM integration was achieved through OEM exposed system APIs.
- Mobile Devices having LTIs tracking application leveraged push APIs for broadcasting their trip and delivery alerts along with safety alerts.
- For high speed streaming Oracle PaaS SOA cloud service was leveraged for rest based communications across different systems and devices.

Tracking Mobile App:
- An android based native app was developed specifically for tracking the fleet movements.
- The app had geofence logic inbuilt for dynamically notifying Trip Start, End, Entry, Exist at customer location, route deviations and more.
- It also had intelligence to only track the fleets when there was a live trip associated with it. The tracking was push notification driven.
- Application also leveraged Samsung’s KNOX platform for device control to restart/resync for high degree of data capture and less data loss.

Portal Application:
- The platform had a consolidated dashboard that provided information on fleet utilization, alerts, reports, delivery compliance and more.
- It enabled site managers and administrator to perform device, driver, fleet management.
- It had inbuilt capability to dynamically geophone any newly added customer location and providing alerts wherever deviations were observed.

E-Proof of Delivery (E POD)
- While giving site managers, logistic managers the flexibility to monitor the deliveries, the system also implemented an E-POD feature to capture delivery compliance and customer satisfaction.
The solution for EPOD was an interesting one considering the segment of users involved in entire process chain. The system had 2 modes of capturing this information, one was through the inbuilt geofence tracking mechanism which doesn’t require any action from users. The other enabled users to use either SMS, Portal or Customer Care channel to share their delivery feedback. Interestingly the 1st option presented with very precise information on delivery compliance and some important insights on why deliveries were late in specific region, location and time of the year.

Below is depiction of the EPOD process for quick reference.

Solution Components & Features Leveraged

- **T&T App**
  - Live Tracking
  - Find Near By
  - Geo Fencing
  - Driving Pattern
  - Remote Configuration

- **Reports**
  - Trip Reports
  - Exception Reports
  - Dashboards
  - Safety Rating
  - Configurable

- **Portal**
  - Dashboard
  - User Based GUI
  - Trip Playback
  - Route Mapping
  - ERP Integration

- **User Experience**
  - Trend / Analytics
  - Personalization
  - Mobility
  - SMS/Email Notifications
  - Alerts
4 Business Benefits

The ATS platform gave customer the flexibility to introduce a single platform for managing their logistic fleet management needs efficiently. At the same time, it allowed them to leverage their existing investment on OEM solutions and giving them a technology-driven platform for a new set of fleets, thus enabling them on digitalization of their supply chain. Customers today, are leveraging the ATS platform to integrate their distributed logistic applications and embark on Digital transformation to meet some key objectives given below:

- **End-to-end SCM Visibility** to improve accountability key stake holders across supply chain
- **Future ready “Scalable Platform”** - Platform to integrate / Optimise current ecosystem. Ready- to-plug in future applications
- **Power of Data to Business** - Leverage "tonnes of data" and analytics to provide useful real-time insights to business
- **Mobility** to enable business anytime anywhere

5 Conclusion
6 About the Author

**Nilesh Pawar** is a Principal Solution Architect with 10+ years’ of IT experience, with proficiency in delivering implementation & support projects using Oracle Fusion Middleware & PaaS Cloud Product stack. He has been a Technical Subject Matter Expert (SME) during all phases of IT project execution that includes right from requirements gathering, assessment to implementation and adoption, he has been engaged with customers belonging mainly to Manufacturing, Oil & Gas, Banking, Payment & Cards domain, IT sector etc. As a Solution Architect, he has abundant experience in executing various large enterprise business modernization projects in India & onsite US, Europe, Asia-Pacific, Middle East.

**Amit Mehetre** is a Solution Architect with Oracle Digital Practice at LTI. He brings 12 years of experience around designing, delivering, consulting and leading successful Implementation projects for enterprises. He has worked in India, North America and Europe in providing innovative digital and mobile solutions across Manufacturing, Finance, Retail domains.