Connected Truck: Impact on Maintenance

May, 2017
Table of Contents

1. FMS: Impact on Fleets and OEMs  3
2. Connected Truck: Impact on Maintenance  8
3. Areas of opportunities in GCC  16
4. About Frost & Sullivan  18
Fleet Management Systems: Impact on Fleets and OEMs
## Top Strategic Findings

“Conventional” solutions (non-telematics) for the fleet operator and general transportation market trends

<table>
<thead>
<tr>
<th>Solutions designed to address Fleet Operators’ Needs</th>
<th>• TCO vs Fleet Benefits: fleet management solutions help logistic operators to minimize operational costs, maximize productivity, generate value through market differentiation and ultimately increase customer satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Priorities of the Fleet Manager</td>
<td>• Fuel saving, driver wage reduction and maximizing fleet utilization are top three priorities for the fleet operator</td>
</tr>
</tbody>
</table>
| Growth of Multimodal Logistic | • Major fleets are becoming logistics operators, integrating different modes of transport  
• Share of owned trucks is decreasing; leasing, renting, brokerage are increasing |
| Top Solutions | • Top solutions required by fleet operators are: fuel-saving related solutions, driver training and eco-driving, transport planning and integrated logistic scheduling |
| Integration with Telematics | • Seen as beneficial but not as essential as few years ago. As TMS is becoming the core of the logistic operator, smartphone–based solutions and apps are increasing in penetration towards traditional fleet telematics systems, providing increased customization on fleet operator needs and higher integration with TMS |
**Different Tools used by Fleet Operators**

Non-telematics based fleet management solutions used by fleet operators to optimize their cost of operation

<table>
<thead>
<tr>
<th>FMS Solutions</th>
<th>Definitions</th>
<th>Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Card Service</td>
<td>Manages fuel usage, analyze spending patterns and eliminates pilferage</td>
<td>• DKV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• UTA</td>
</tr>
<tr>
<td>E – procurement</td>
<td>Facilitates e-Trading solutions for the contract hiring and rental markets</td>
<td>• Ebbon-Dacs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Coupa Procurement</td>
</tr>
<tr>
<td>Routing &amp; Scheduling Software</td>
<td>Helps in efficient route calculation using live order volumes</td>
<td>• Made4net</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Viament</td>
</tr>
<tr>
<td>Logistics Software</td>
<td>End-to-end services i.e. order booking, warehousing, transportation and order fulfillment</td>
<td>• Agile Network</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Catapult International</td>
</tr>
<tr>
<td>Maintenance scheduling software</td>
<td>Helps in fleet equipment tracking, fleet maintenance tracking and vehicle history management</td>
<td>• Astea International</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Emaint</td>
</tr>
<tr>
<td>Toll Management Software</td>
<td>Enables consolidated billing, gaining centralized controls, reporting and payment processing</td>
<td>• Donlen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• UTA. Non Stop</td>
</tr>
<tr>
<td>HR/Compliance Software</td>
<td>Automates HR practices, manage drivers, implement safety programs and ensure regulation compliance</td>
<td>• SAP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Kronos</td>
</tr>
<tr>
<td>Enterprise Software Solution</td>
<td>Streamline processes, improve performance and reduce operational costs</td>
<td>• Chevin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• jda</td>
</tr>
</tbody>
</table>
# FMS Services Roadmap

New services of FMS are likely to provide more value to fleet owners and help to reduce the return on investment period.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2014</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Map Information</strong></td>
<td>Shortest</td>
<td>Eco-route</td>
<td>Secured, tolling, charging, real-time parking slots routes</td>
</tr>
<tr>
<td><strong>ADAS Integration</strong></td>
<td>Brakes, odometer, gear box, engine and CAN BUS, accelerometers and others</td>
<td>In-cab camera, lane departure warning, forward collision warning, roll stability control, blind-spot detection, active cruise control, and others</td>
<td></td>
</tr>
<tr>
<td><strong>Driver Behaviour</strong></td>
<td>Training</td>
<td>Real-time feedback—dashboard</td>
<td>Real-time/active vehicle control</td>
</tr>
<tr>
<td><strong>Product Portfolio</strong></td>
<td>Trucks only</td>
<td>Truck telematics + Trailer Management + TMS (one stop shop; offering truck telematics, trailer telematics and transport &amp; logistics management)+Video based Safety Solutions</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Management</strong></td>
<td>Trucks only</td>
<td>Bi-modal (trucks-rail) and multi-modal (trucks-rail-sea-air)</td>
<td></td>
</tr>
<tr>
<td><strong>Mobile Apps</strong></td>
<td>Location</td>
<td>Driver comparison</td>
<td>Tolling and charging</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Driver drowsiness intimation</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td>2G</td>
<td>2G / 2.5G / 3G / Wi-Fi / Satellite - World-wide Chipset (GOBI)</td>
<td></td>
</tr>
<tr>
<td><strong>Type of Solution</strong></td>
<td>Embedded and Portable – smartphone as APP</td>
<td></td>
<td>Independent Smart phone Solution</td>
</tr>
</tbody>
</table>
Evolving FMS Vendors – Expanding Value Chain

Non-traditional telematics vendors have started recognising the opportunities in the telematics arena, and they will improve and enhance the evolving value chain ecosystem.

CV Telematics Market Outlook: Evolving FMS Vendors, Global, 2015

- **Navigation**
  - **TomTom’s WORKsmart:** Navigation, traffic avoidance, vehicle tracking, dispatching, time management, driver safety, environmental responsibility, and integration

- **Tyre/Component Suppliers**
  - **Pirelli’s Cyber Fleet:** Tyre condition, fuel optimisation, and CO2 emissions
  - **Michelin’s Premier Elite:** Visibility on operations and maximising ROI on assets
  - **Wabco:** Acquired Transics to monetise opportunities arising from vehicle usage analysis and data sharing, combining its existing capability in diagnostic and support tools

- **Fuel Companies**
  - **Shell’s Fuel-Save Partner:** Focus on vehicle performance and fuel management
  - **Fleetcor Recent acquisition of Masternaut**

- **Network Providers**
  - **Verizon:** Acquired Hughes Telematics to venture into fleet telematics, focusing on safety, security, convenience, and infotainment solutions

- **IT Companies**
  - **Google’s Google Coordinate:** Focus on workforce management

- **OEMs**
  - **Daimler:** (FleetBoard) Standard telematics solution across Actros and Antos
  - **Volvo:** (DynaFleet/VolvoLink) Optional across all models
  - **Scania:** (Communicator) Standard in all new trucks

Source: Frost & Sullivan
Connected Truck: Impact on Maintenance
Truck Operations

Maintenance costs account for up to 5 percent of Total Cost of Ownership

Benefits After Effective Deployment of Fleet Management System

- 10-15% Increase in Productivity
- 10-15% Overtime Reduction
- 20-25% Reduction in Fuel Expenses
- 5-10% Reduction in Total Miles
- 20-30 minutes Day/Driver Labor Savings
- 15-20% Increase in Vehicle Utilization
- 20-30% Reduction in Vehicle Idle Time

Source: Frost & Sullivan.
Connected Trucks Improving Maintenance

Aftermarket analytics and in-store technologies will be used to engage the customer at all stages of the purchasing cycle to personalize the buyer experience.

Value-added Services in Connected Ecosystem

- Automated pre- and post-trip vehicle inspections of drivers are relayed back to the maintenance shop in real time.
- Dynamic sensors monitor the truck’s engine and other systems.
- Preventive maintenance scheduling and execution are based on the vehicle and its historical data.

Aftermarket Implications

- Regular real-time maintenance will bring in timely revenue through automated part sourcing.
- Aftermarket labels should concentrate more on the eRetail segment to sell smaller DIY parts with high replacement to garner a better position in the aftermarket, compared to OES suppliers.
- Aftermarket vendors can effectively use documentation and recordkeeping of maintenance and repair details through connected trucks to keep track of replacement cycles.
- By pitching real-time updates of likely risk avenues to fleet owners, timely sales of parts could be partnered.

Source: Frost & Sullivan
Fleet Telematics Penetration – LCV and Trucks

Penetration of LCV would be driven by smart phone type of solution, while MCV/HCV would be driven by OEM’s decision to offer FMS as standard in certain models along with mandatory regulations.

Appreciable growth rate is expected across NA for LCV, M/HCV as fleets are increasing their pace to utilise telematics both as a management tool and an additional revenue generator.

+15.2% CAGR

Source: Frost & Sullivan

2014

LCV Penetration

M/HCV Penetration

Penetration Vehicles in Operation (VIO)
Who Offers Connected Truck - All Eco-System Partners

All value chain partners (from OEM to tire / component manufacturers) are assessing to offer their own FMS solution; Consolidation drives this trend.
Connected Trucks Open Opportunities in Predictive Maintenance

Predictive maintenance and analytics will increasingly encompass vehicle systems, offering improvements in vehicle uptime and reduction in lifecycle costs, while creating new revenue streams.

Medium- and Heavy-duty CV Aftermarket: Opportunities in Predictive Maintenance, North America, 2015

- **Dealerships**
  - Engages with telematics service provider/OEM/dealership to reduce downtime and enhance fleet efficiencies
  - Uses prognostics data analysis for fleet maintenance improvements and cost reductions
  - Reduce inventory costs
  - Improve critical parts availability
  - Help proactive dealers increase their service business
  - Increase customer communication, leading to customer loyalty
  - Improve service shop efficiency
  - Lead to increase in contract maintenance opportunities

- **Analytics Companies**
  - Engages with OEMs to offer data analytics support for prognosis data
  - Reduce warranty cost on certain parts or negotiate with the supplier of that system
  - Build safer and more reliable vehicles
  - Create monthly revenue streams through the vehicle’s lifecycle

- **Fleet Manager**
  - Provides electronic interfaces
  - Derive a share of monthly revenues

- **Fleet Maintenance Software**

- **Wireless providers**
  - Derive a share of monthly revenues

- **OEMs**

- **Tier 1 Suppliers**

Source: Frost & Sullivan
Application of Big Data in Maintenance Cost Optimization

Prognostics delivered through effective Big Data utilization can be offered at $7 to $15 per truck, per month, offering significant downtime reduction benefits to fleets.

Executive Analysis of Big Data in CVs: Maintenance-related Data Sources and Optimization, Global, 2015

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>Parameters Used for Calculation</th>
<th>Early Detection Analytics Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle data</td>
<td>Payloads</td>
<td>Identify and measure metrics</td>
</tr>
<tr>
<td>Temperature data</td>
<td>Component/vehicle population</td>
<td>Early detection and monitor and share critical issues</td>
</tr>
<tr>
<td>Warranty and service history data</td>
<td>Vehicle performance</td>
<td>Measure and decide actions to be taken</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prescribe corrective actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implement corrective actions</td>
</tr>
</tbody>
</table>

Predictive Asset Optimization Focus Areas and Fleet Benefits

- **Predictive Analytics Focus Areas**
  - Predict recurring/major component failures
  - Predict component life based on installed population
  - Identify and alert anomalies within fleets

- **20% improvement** in overall repair time
- **60 to 70% reduction** in diagnostic time
- **Uptime improvement of 1 day per service event**

Prognostics enable fleet managers to improve their trucks’ uptime and reduce business disruptions through early notifications and proactive repair scheduling.

Source: Frost & Sullivan
**Estimated Potential Savings by Function for OEMs**

<table>
<thead>
<tr>
<th>Function</th>
<th>Estimated Potential Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Development and Manufacturing</td>
<td>6–20%</td>
</tr>
<tr>
<td>Marketing and Sales</td>
<td>8–17%</td>
</tr>
<tr>
<td>Warranty and Quality</td>
<td>7–15%</td>
</tr>
<tr>
<td>Prognostics/Predictive Maintenance</td>
<td>17–25%</td>
</tr>
</tbody>
</table>

**Estimated Potential Savings for Fleets**

<table>
<thead>
<tr>
<th>Function</th>
<th>Estimated Potential Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel and Route Optimization</td>
<td>10–25%</td>
</tr>
<tr>
<td>Use-based Insurance</td>
<td>7–30%</td>
</tr>
</tbody>
</table>

Big Data analysis in North America could deliver about 20% in maintenance savings for fleets.

Note: Values were obtained from primary and secondary research. Source: Frost & Sullivan
Areas of opportunities in GCC
Reducing maintenance cost

Parts costs of a heavy commercial vehicle (including ties and lubricants) in GCC can exceed $3,000 per year. Usage of predictive maintenance has potential to reduce it by up to 20%.

Reducing traffic casualties

Heavy Commercial Vehicles cause up to 14 deaths on UAE roads every year. Typically, heavy trucks account for up to 10% of accidents. Telematics help significantly reduce harsh braking and speeding which often cause accidents.

Reducing traffic

Long haul trucks typically run around 110,000 km every year in CC. Telematics can reduce traffic through intelligent route planning (to 5-10% reduction in total distance possible).

New business opportunities

New business models in such areas as digital brokering (e.g. Uber for Trucks, LoadMe), big data analysis etc. will open up new opportunities for local and global companies in GCC.
About Frost & Sullivan
Introduction to Frost & Sullivan

Frost & Sullivan is a leading global strategy consulting company, headquartered in the United States. Established in 1961, in New York City, the company today has 40+ offices across the globe. It has 3 offices in the Middle East in Dubai, Bahrain and the KSA.

The company has a domain knowledge approach to research and strategy consulting (dedicated team of 300+ automotive researchers and consultants globally, 20+ specifically working for MENASA). The automotive team has been working closely with OEMs and Vehicle Dealerships in the KSA, the UAE, Kuwait and in Middle East, Africa on multiple projects ranging from price benchmarking to developing their long term strategy and identifying specific areas of business opportunity.
### Core Functions

<table>
<thead>
<tr>
<th>CEOs office</th>
<th>Vendor Sourcing</th>
<th>R&amp;D Technology</th>
<th>Manufacturing</th>
<th>Sales and Marketing</th>
<th>Channel Management</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Growth Strategy</td>
<td>• Vendor / Supplier Identification</td>
<td>• Regulatory Analysis</td>
<td>• Manufacturing Excellence</td>
<td>• Market Entry Strategy</td>
<td>• Dealer Development</td>
<td>• Usage and Attitude</td>
</tr>
<tr>
<td>• Geographic Expansion</td>
<td>• Vendor Satisfaction</td>
<td>• Technology Assessment</td>
<td>• Econometric Analysis</td>
<td>• Spare Part Pricing</td>
<td>• Brand Equity</td>
<td>• Brand Equity</td>
</tr>
<tr>
<td>• Partner Identification</td>
<td></td>
<td>• Product clinic</td>
<td>• Dashboard – Market Information</td>
<td>• Dealer Benchmarking</td>
<td>• Cost of Ownership</td>
<td>• Cost of Ownership</td>
</tr>
<tr>
<td>• Mergers and Acquisitions</td>
<td></td>
<td>• Technical Insights</td>
<td></td>
<td>• Dealer Training</td>
<td>• Product Clinic</td>
<td>• Product Clinic</td>
</tr>
<tr>
<td>• Techno Economic Feasibility Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Customer Satisfaction</td>
<td>• Customer Satisfaction</td>
</tr>
</tbody>
</table>

### Support functions

- Finance
- Administration
- Human Resources
- Information Technology
- Quality Assurance
- Corporate Communication
- Legal Compliance
- Logistics

**Fund Raising**
- Company Due Diligence
- Salary Benchmarking

**Management Systems**
- Management Systems Awards

**Brand Protection**
- Brand Protection

**Infrastructure Assessment**
- Infrastructure Assessment

**Product Offerings for Automotive across Value Chain**

---

**20**
Frost & Sullivan’s Automotive Practice offers 6 levels of Consulting and Advisory Services

### Key Organisational Challenges

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Strategy Workshops and Advisory</td>
<td>Strategy Workshops with Boards and Senior Teams on Business and Strategic Planning, Growth Roadmaps, Solving Critical Business Issues</td>
<td></td>
</tr>
<tr>
<td>5 Partner Identification and Research</td>
<td>Working on Inorganic Growth: Mergers and Acquisitions, Joint Ventures, Partner Identification to Due Diligence, Structuring and Post Deal Integration</td>
<td></td>
</tr>
<tr>
<td>4 Consulting Projects</td>
<td>Long term Engagements on Identifying Growth Options, Market Entry Strategy, Business Portfolio Assessment and</td>
<td></td>
</tr>
<tr>
<td>3 Customised Market Research</td>
<td>Customised Market Research Projects to Analyse and Evaluate Customer Requirements, Competition Business, Industry Trends and New Growth areas</td>
<td></td>
</tr>
<tr>
<td>2 Syndicated Research Reports</td>
<td>Knowledge Centre Reports and Industry Updates on Market and Competition provide Tactical Information Support</td>
<td></td>
</tr>
<tr>
<td>1 Decision Support Databases</td>
<td>Customised Databases and information provide all necessary inputs for Operational Planning</td>
<td></td>
</tr>
</tbody>
</table>

### Support Advisory Services

- Financial Advisory
- Supply Chain Engineering
- Manufacturing Advisory
Disclaimer

This White Paper prepared by Frost & Sullivan is based on analysis of primary, secondary information and knowledge available in the public domain. While Frost & Sullivan has made all efforts to check the validity of the information presented, it is not liable for errors in information whose accuracy cannot be guaranteed by Frost & Sullivan. Information herein should be used more as indicators and trends rather than representation of factual information. The White Paper is intended to set the tone of discussions at the conference in which it was presented. It contains forward-looking statements, particularly those concerning growth, consumption, policy support for water supply. Forward looking statements involve risks and uncertainties because they relate to events, and depend on circumstances, that will or may occur in the future. Actual results may differ depending on a variety of factors, including product supply, demand and pricing; political stability; general economic conditions; legal and regulatory developments; availability of new technologies; natural disasters and adverse weather conditions and hence should not be construed to be facts.

Copyright notice

The contents of these pages are copyright © Frost & Sullivan. All rights reserved. Except with the prior written permission of Frost & Sullivan, you may not (whether directly or indirectly) create a database in an electronic or other form by downloading and storing all or any part of the content of this document. No part of this document may be copied or otherwise incorporated into, transmitted to, or stored in any other website, electronic retrieval system, publication or other work in any form (whether hard copy, electronic or otherwise) without the prior written permission of Frost & Sullivan.
State your need, we would be happy to serve you...

Contact Information

Frost & Sullivan Consulting Bahrain WLL
Unit 121 & 122, 9th Floor,
Unisono Tower, Building 614,
Road 1011, Block 410,
Sanabis, PO Box 65172, Kingdom of Bahrain

Contact
Vitali Bielski
Senior Consultant – MENA, Automotive Practice
E-mail: vitalib@frost.com
Bahrain Mobile: +973-344-27416
Landline: +973-17387666

Contact
Subhash Joshi
Regional Head – MENA, Automotive Practice
E-mail: subhashj@frost.com
UAE Mobile: +971-56-7686450

Frost & Sullivan International Inc.
22601, Swiss Tower,
Cluster Y, Jumeirah Lake Towers,
P O Box 33372
Dubai, United Arab Emirates