Managing Outbound Logistics for Car and Goods Manufacturers

The Growing Importance of Outbound Logistics

As it directly impacts the input costs of the goods, inbound logistics has traditionally been a major focus area for manufacturers and service providers. With emergence of low cost country (LCC) manufacturing, raw material got shipped to the country with lower labor and production costs. Countries with availability of raw material coupled with availability of low cost labor and other infrastructure leap-frogged into manufacturing of goods. These goods were then shipped to different markets where they were consumed. In this process, inbound logistics networks were enhanced with IT and infrastructure support. Original Equipment Manufacturers (OEMs) from different regions in the world incur significant though varying level of costs (as percentage of their sales) on logistics. [1] [2]

The new-thinking around manufacturing is lowering cost arbitrage of LCC. Hence, leverage of U.S. and Mexico as export bases is emerging as an approach among certain Japanese and European OEMs. In some respects, this phenomenon can be termed “re-shoring” discussed further in this paper. Re-shoring has opened up new logistics (both inbound as well as outbound) routes and avenues for 3PLs. Ports in the U.S. and Mexico, in particular, need to address revved up demand emanating from North American manufacturing bases.

Over the course of time, the industry has realized that outbound logistics (OBL) would also need equal attention and investments in order to enhance the efficiencies and reduce wastage in the overall supply chain. This paper addresses various aspects of outbound logistics, including the stakeholders involved and their performance indices, along with a brief of services that Cognizant provides in this area. This paper pays special attention to transportation of finished vehicles, as it represents the broader issues in outbound logistics.

Postponement strategy and its impact on OBL

Goods manufactured in production facility need transportation to intermediate and final destinations. During their journey they may be stored temporarily at a warehouse, or some value addition may be done to them before they are delivered to the customer. This value addition is commonly known as ‘postponement’. Postponement is carried out in all types of goods: from commercial vehicles to passenger cars and from chemicals to electronics and mobile devices. Manufacturers adopt postponement approach to make finer value addition almost at the end of the logistics value chain and as close to customer delivery as possible. This helps in managing demand fluctuations and optimizing costs through standardization of core manufacturing processes; however it makes OBL a critical part of the value chain. OBL must be managed properly in order to make the whole strategy work.
Managing the logistics involved in moving finished vehicles from factory to dealers (or, in some cases, directly to customers) requires an extensive transportation and intermittent storage network. Vehicles are transported via road (trucks), rail and ocean modes. In cases where multimodal transportation is used, intermediate storage facilities are often used for temporary parking and retrieval of the vehicles.

Thus, the OBL process involves a large number of entities. Vehicles are constantly changing hands (and ownership) at various places and transportation modes.\[3\] If vehicles need to cross international boundaries, customs and other mandatory documentation must be completed. All this complexity means that optimizing the OBL process is a serious challenge today for the manufacturers, who either manage the transportation process themselves (fully or partially), or outsource it to third-party logistics service providers (3PLs).

Two sides of the new OBL model: Manufacturers and Logistics Service Providers

Ups and downs in production volumes have a direct impact on the logistics industry. In recent times, as the U.S. domestic automotive industry has recovered from recession and plant and hauler closures, a new wave of merger and acquisition has taken fold.\[4\] Since the carriers have not kept pace with the increase in U.S. car production from the fall of 2008, there has been substantially under-capacity at the carriers' end.

As convenient and cost effective ocean transport is available between the production sites and markets around North America, many ports in U.S. have been running at full capacity and have also started increasing the capacity of their infrastructure.\[5\]

Many automotive OEMs now follow a ‘demand pull’ model rather than the traditional ‘supply push’ model. European car market has traditionally been working on ‘Pull’ model so the impact of the change will be felt more in North America where vehicle stock would be piled up to cater to domestic demand. Since there is more focus on OTD (On Time Delivery) in ‘Pull’ based fulfillment, it has put pressure on 3PLs and transporters to keep up with the change. They need to be more agile in their services to their OEM customers as well as to dealers and end consumers.

OBL and the extended supply chain

Many car makers have already optimized the in-bound supply chain and, to some extent, the outbound supply chain. For those in the process of optimizing the outbound supply chain, the focus is on assets already in the factory or at intermediate yards, ocean ports, truck and trailers, rail cars purpose-built for vehicle transportation, and ocean liners that transport vehicles across the globe. For optimal performance of the overall supply chain, it is important that the transportation and warehousing processes are diligently followed and activities harmonically synchronized. Greater operating efficiency in these areas will result in shorter delivery cycles and improve OEMs’ OTD performance.

However, OTD performance is dependent on multiple factors and not just the network and components of OBL. Feedback from carriers in the transportation network is required by sales planning and production planning functions, in addition to OBL planning itself. To maintain operational efficiency, OEMs need an accurately meet OTD to their dealer networks and keep optimum inventory in the supply chain.

Emerging trends in Logistics

- **Multimodal transport management systems.** Multimodal transport management systems (TMS) are catching up against traditional single mode transportation. The automotive industry must leverage multimodal transport to achieve efficiency in outbound logistics and reduce transportation costs.

- **Customized vehicle transportation infrastructure.** Owing to both vehicle import and export requirements from almost every continent, automotive finished vehicle transportation uses ocean, rail and road modes extensively. Every mode of transport has led to the development of custom equipment for vehicle transportation. Ocean carriers have developed multi-level roll on–roll off (Ro Ro) vessels also known as PCC, or pure car carriers. PCCs can carry upwards of 6,000 cars on board. In the U.S. and Europe, railcars feature specially designed wagons to carry vehicles. Some are OEM branded and designed exclusively for certain makes and models to carry more vehicles over longer distance and consume less of fuel and energy per vehicle delivered.

- **Investment in information technology.** Investments in IT infrastructure are increasing. Most OEMs now want their 3PLs to provide vehicle tracking
information using their vehicle identification numbers or “VINs,” right from the factory to dealer deliveries. Since vehicles change hands at many locations and handlers, information is often lost or not available with the OEMs. Web-based IT systems are now used by OEMs and 3PLs alike for better visibility into transportation and warehousing facilities. In addition to OEMs and 3PLs, ports are also investing in physical and IT infrastructure.

- **Re-shoring and near-shore manufacturing** Over the last few years, the automotive industry (like other manufacturers) has started bringing production back to the U.S. or closer to American shores. Mexico has emerged as favorite destination for top automakers as it has convenient access to the U.S. via short ocean routes or rail and road networks. At the same time, many OEMs have started sending production of certain models produced in the U.S. to South America. This has led to a situation where the U.S. not only is a significant importer of automobiles, but is also becoming a major exporter of automobiles. This re-shoring will result in changing supply networks and re-configuration of on OBL as a process for many organizations.

The KPIs in Outbound Logistics

On time delivery (OTD) performance remains the most important among the key performance indicators (KPIs) in OBL. This KPI reflects schedule adherence of the OEM with respect to original order promise date at the time of order acknowledgement. However, to meet or improve the schedule adherence, OBL improvements or optimization is not enough. The factors affecting delivery schedule start right at the time of sales planning and cut across the procurement and manufacturing process. Figure 1 shows a sample of Level 1 KPIs on Outbound Logistics.

Analysis of various OBL KPIs can be used to improve OTD performance and provide closed-loop feedback to the planning process. This has a direct bearing on capacity planning – to inform and keep production and logistics requirements in alignment with the organization’s sales and marketing targets. The Theory of Constraints [6] applies to the entire value chain – starting with the planning process right up to transportation of vehicles. Any mismatch in the capacity can lead to imbalance in the demand-supply equation.

**Outbound Logistics Suite**

**Leveraging Cognizant’s OBL Suite**

We work with various automotive and logistics stakeholders in the OBL network, including the OEMs themselves, the 3PLs and 4PLs, the transporters, and the dealers. Figure 2 illustrates the spread of our outbound logistics related solutions and services.

Our solutions for OEMs, 3PLs and Transportation Providers are briefly described below:

- **Third-party logistics providers**: We work with several leading U.S. and European 3PLs in projects covering RFID-enabled inventory tracking, mobility solutions, transportation strategy consulting and implementation and maintenance of WMS and TMS applications. Customers not only expect 3PLs to carry out logistics operations but they also expect visibility and tracking of their cargo during the process. OEMs have started using ASNs and EDI communications with 3PLs and ports extensively to track their vehicle VINs. The information need is driving emergence of 4PLs from among the service providers. Cognizant understands these information needs and has been providing solutions around them. For example, one of the top cold storage chains in the U.S. utilizes our services to manage their TMS and WMS applications 24x7.
• **Rail and road transporters:** Almost 70% of new vehicles sold in North America – both imports and domestic – are moved closer to the dealerships using railroad carriers. Automakers have worked with railroad carriers in North America (and also in Europe) to design rail cars specific to their requirements. Some even have exclusive and branded railcars built for this purpose. Road auto haulers carry cars using 18 wheeler tractor-trailers from almost 70 manufacturing plants and more than 25 ports in North America to their final destination of more than 14,000 new vehicle dealers. The average distance for truck transport falls within a 250-mile radius of the pickup point. We work with two of the top U.S.-based less-than-truckload (LTL), truckload and intermodal service providers and two of the top U.S. based Class 1 railroad companies. The scope of work includes transportation planning and strategy consulting, customer relationship management (CRM), business intelligence and asset management.

• **PCC (pure car carriers) ocean carriers:** PCC Ro-Ro carriers facilitate import and export of the vehicles the world over. Ro-Ro is typically the most reasonably priced option for vehicle transportation even though premium cars may be transported using container vessels. Leading Ro-Ro ocean carrier of finished vehicles from Europe and the U.S. engage us for their ocean transport management systems. We also work with the world leaders in container and supply vessel operator segments in CRM and master data management (MDM) areas.

• **Yard management (Yardelligent):** Yardelligent, Cognizant’s Yard Management Solution, has been specially designed for automating and optimizing operations at finished vehicle yards and sea ports. Yardelligent enables yard and port planning, storage, retrieval and maintenance of finished vehicles and visibility of their status in the transportation network. With Yardelligent, yard operators can have the desired level of real-time visibility and control of vehicles at the yard, thereby making the automotive supply chain truly optimized and efficient.

Figure 3 shows Marine Survey module screenshot in Yardelligent. This solution has been implemented for a leading 3PL in Belgium and is being used by a leading auto OEM in Japan.

• **Connected Fleet:** Our Connected Fleet Program provides telematics and GIS solutions for fleet managers, truck and bus owners and car owners. For the commercial transportation sector – both goods and passengers – we created a comprehensive solution that addresses ongoing reduction of total cost of ownership (TCO) of vehicles using telematics data. We provide end-to-end asset tracking solutions for vehicles and containers in the logistics and distribution operations. Using GPS and asset tracking devices and sensors from trusted partners and GeoLocus, a proprietary GIS services platform, we provided comprehensive fleet management solutions to OEMs and 3Ps alike. Our Connected Fleet solution can also help in creating predictive models for vehicle resale value based on driving behavior monitoring and alerts. Cognizant has also developed driver score card applications indicating driver’s behavior and driving patterns.

• **Business process services:** Apart from full end-to-end Business Process Services, Cognizant has been involved in specialized services for automotive domain. Finished vehicles logistics across globe is one of the key parameter for automotive OEMs for competitive advantage. We assisted one of the European luxury car manufacturers during the migration of their transport management system by handling processes and data. Further, we helped the client to monitor vehicle deliveries, freight and vehicle invoice triggers, hold management in yards, reporting performance of carriers, master data management for calendars, routes, delivery and stock locations, dealer swap and market swap processes. We also supported reporting of key parameters like inventory ageing at the yards, lead time variance, port dwell time, pick up and drop off precision.

• **OBL analytics:** Using advanced predictive analytical tools and techniques, we can help provide better inputs from OBL network to sales and production planning process while improving OTD promise to dealers and customers.

• **Social media sentiment listening and analysis:** This is our on-demand service for regular and event based social media watch, covering competitor intelligence, lead generation, technology trends, supply chain disruptions, product design feedback and customer experience.
Looking Ahead: The Next Steps

When considering how an organization should overhaul its outbound logistics planning and transportation management practices, decision makers can use these questions to make a start:

- How should we adapt our planning policies with closed loop feedback from nodes in warehousing and transportation? How can the information and constraints in logistics network be incorporated in our Sales and Operations Planning (S&OP)? Can we improve customer satisfaction by improvements in outbound logistics?

- How can we quickly respond to changing dynamics (e.g., re-shoring of manufacturing operations from off-shoring) in the global economy?

- How can we decide on our postponement models? Should the accessories be fitted at the factory yard, or just before they are delivered to the dealers, or in some cases the consumers themselves?

- How can we track goods and vehicles with visibility in their current statuses and geographical locations? How can asset tracking improve finished goods inventory turnover?

- Is there a need to assess maturity of our IT services enabling the outbound logistics network? What changes, if any, are required in our infrastructure, IT and otherwise? Should the data be available in real time or in batch mode?

- How to leverage latest technologies that would significantly improve efficiencies in the logistics operations? Can these be used to reduce muda (waste) and drive down operating costs?

- What is connected fleet? How telematics can help in overall logistics operations?

- How to adopt SMAC (social, mobile, analytics and cloud) and data visualization technologies? What benefits the business stakeholders can expect?

Footnotes

- [1] According to industry estimates, the average cost of OBL for finished vehicles is approximately 3% for Indian OEMS, 8% for European OEMs and 5% of the sales for Japanese OEMs.

- [2] Automotive components incur one to two percentages higher in their logistics cost over finished vehicles. On an average, the OBL cost is 20% less than the overall logistics costs; inbound logistics costs, moreover, can run 10% to 15% higher than average logistics costs.

- [3] Of the total cost of logistics, 50% is accounted for by transportation expenses alone.

- [4] In 2007, the U.S. produced 10 million-plus vehicles; that figured sunk to 8.7 million and 5.7 million annually, in 2008 and 2009, respectively. However, production soared to 14 million last year and is forecasted to reach 15.6 million this year.

- [5] The ‘Finished Vehicle Logistics’ annual port survey reveals good growth for almost all the ports that participated in the survey. Of the 22 ports reporting 2012 figures, overall volume was up 21.9%. A stronger U.S. sales market, plus the strong recovery among Japanese carmakers and growing German luxury car sales, led to 23.5% growth in imports. Exports were also strong, rising more than 18% in 2012.


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About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process outsourcing services, dedicated to helping the world’s leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work. With over 50 delivery centers worldwide and approximately 162,700 employees as of March 31, 2013, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world. Visit us online at www.cognizant.com or follow us on Twitter: Cognizant.

For more information on how to drive your business results with Cognizant, contact us at inquiry@cognizant.com.

Manufacturing & Logistics Practice

Our global workforce of engineers, technology experts, and business consultants has extensive experience helping many of the world’s leading automotive, industrial and process manufacturers and transportation & logistics service providers. Thanks to our domain solutions and integrated services capabilities, Cognizant’s business and industry experts work hand-in-glove with our technology and engineering teams, ensuring our clients receive an exceptionally well-coordinated effort from conception to completion.

Cognizant Automotive Solutions team has been conceptualizing, developing and executing thought leadership based solution offerings for automotive OEMs and Tier 1 suppliers. We strive to enhance performance of these companies through the entire process of vehicle lifecycle operations. Leveraging latest technologies such as social, mobile, cloud, predictive analytics and data visualization techniques, we help companies keep ahead of with dynamically changing global environment and effectively mitigate new risks. Some of our current focus areas are Connected Car & Telematics, Outbound Logistics & Yard Management, Social Listening, dealer management, warranty and S & OP planning.

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