TRANSPORTATION MANAGEMENT SYSTEMS: AN INDIAN PERSPECTIVE

Technology Enablement for the Transportation Industry in India
| Whitepaper
THUMBS-DOWN TO THE GLOBAL MELTDOWN

The global melt-down is here and the nay-sayers are all on a roll about the impending doom. Companies are looking at multiple options to manage the challenging situation that the occurrences in the global economy have put them into. Supply Chain costs therefore are of special significance in such market conditions as they hold the key to managing profitability and ensuring better health of the organization.

India is no exception!

Logistics costs in India are estimated to be nearly 13-14% of the GDP of around $1 trillion. This cost is significantly higher as compared to the developed economies where the logistics costs are around 7-8% of the GDP. What this means to companies is that there is a huge potential to optimize the costs of logistics.

Supply Chain costs are spread over multiple domains starting from Import-Export Logistics to Transportation to Warehousing and finally Distribution. In a country like India which has a large geographic dispersion and manufacturing clusters based at key locations, transportation becomes a key link to managing the costs. In fact, Transportation accounts for the largest single cost component of logistics, estimated to be nearly 35%-40% of the total logistics costs.

There are multiple reasons for this. India has traditionally been a country that thrives on the entrepreneurial spirit of the hinterland. Hence all transportation needs, especially ground transport, were being met by small transport operators (more than 80-85% of the market) who own less than 5 trucks of smaller tonnage. This leads to an extreme fragmentation of the industry and thereby the cost of managing the overall delivery is high.

In addition, the Indian transportation industry has multiple layers of demand and capacity agents who are essentially people who play the intermediary role of matching demand and capacity albeit at a sub-optimal price. The rail transport mode makes sense for a few industries. However due to the lack of the coordination with other modes, seamless multi-modal transport is at the moment a difficult proposition in India.

These are the realities on the ground for transportation in India. However, with the advent of the ‘flat’ world, things have been changing with best practices from around the globe being introduced at various levels. But to achieve success in India, it is important to not just deploy global tools and processes but to understand the hard reality on the ground in India and customize to suit Indian needs. This is where local expertise plays a key role.

One of the primary levers for introducing efficiency is technology. It is a known fact that the prime reason for inefficiencies is the lack of information availability. The more real-time information that is available, it is possible to take corrective measures faster. However, in a country like India, it is important to define what the ‘right’ technology is.

In this paper, we try to examine the relevance of a Transportation Management System (TMS) and how it can deliver value to an organization with complex transport needs. We will examine what features are relevant in a TMS, how to evaluate a vendor, when you need to go for a TMS and what things need to be kept in mind for the Indian scenario.
Technology can be leveraged to optimize transportation at three basic levels: Strategic Direction, Planning and Actual Execution. Companies typically start using technology to help in setting right the basics first (execution challenges) and then as they mature and become lean, they understand the need for using technology to drive strategic direction and planning.

**WHAT IS A TRANSPORTATION MANAGEMENT SYSTEM?**

Transportation Management System refers to a category of software that deals with the planning and execution of the external physical movements (transportation) of products across supply chains. Various subcomponents/features of a typical TMS can be categorized broadly into three categories, namely:

1. Planning and Optimization
2. Execution
3. Visibility and Performance Management

**PLANNING AND OPTIMIZATION**

The key features which a TMS supports with respect to planning and optimization are

- **Load Consolidation** – Firms employ consolidation tactics in order to minimize on the transportation cost and it can be based on any number of considerations including, routing, delivery date, capacity, and customer preferences. Load or for that matter order consolidation help firms to minimize both billable and payable freight costs.

- **Route Planning and Scheduling** - Route Planning allows firms to run businesses more efficiently by managing dozens of customer and regulatory requirements while building the best routes for private or dedicated fleets. It does all this by accommodating a range of factors including delivery windows, delivery appointments, load and unload times, product-to-vehicle compatibility, and driver assignments.

- **Mode and Carrier Selection** - Mode selection analyzes the cost and services requirements for shipments and recommends the optimal mode. In the case of a truckload shipment mode analysis, Transport management system automatically searches for an intermodal rate and service requirement.

If the intermodal mode will meet transit requirements, the load is tendered to move using the lowest cost intermodal provider. This process also applies to LTL versus TL shipment mode analysis. Less than truckload (LTL) orders are automatically pre-consolidated. If a client has multiple orders moving in the same timeframe and same origin/destination, the system will combine them. Each shipment is then auto-rated using both LTL and TL rates stored in the system. These shipments are passed to TMS for LTL mode selection optimization. TMS then consolidates individual shipments into optimal multi-stop truckloads or pool distribution loads. The lowest cost
solution will be returned to the order management module for execution.

Carrier selection takes into account Client loads for the period, Carrier capacity commitment for the period, Carrier’s applicable transportation rate matrix etc. TMS technology optimizes the freight mix for any designated period, providing the minimal total transportation cost for the period regardless of the number of shipments.

**EXECUTION**

**Freight Audit and Payment** – A typical TMS calculates full bottom-line freight costs, evaluates rating and service options, and improves freight audit accuracy. As bills of lading are received, the freight audit tool conducts a rate search of each shipment to verify that the proper version of the contract is used, along with any contract amendments and assessorial charges. This ensures that overcharges are promptly acknowledged and resolved with the carrier. Linkages to ERP and other financial system ensure greater visibility throughout the firm.

**Freight Procurement** – One of the key features of a typical TMS is the freight procurement tool which helps firms in managing the bidding process be it, incremental bidding, multi-round bidding or expressive bidding. It also has features enabling online bidding from various 3PLs wherein they can send quotations and request for proposals, which goes a long way in removing the bottlenecks in case of manual process.

**Multi-modal Transportation** - Built for international users, Transportation Management System (TMS) additions include ocean, rail, and air-based multi-modal transportation support; time-based transit service standards; and enhanced geo coding. Features allow transport by means other than roads, including barge and ferry travel over ocean or Short Sea, maximizing efficient transportation methods and allowing accurate transit time calculation. Software also features global map and guide support.

**VISIBILITY AND PERFORMANCE MANAGEMENT**

**Shipment Tracking and Trace** - communicates shipping information to the carrier and enables track and trace functionality. Web visibility enables timely and accurate shipment tracking, status monitoring, event management, and reporting to efficiently share information across the organization.

**Visibility and Event Management** - Through Event Management & Visibility feature of TMS, each step in the transportation management process can be managed. This includes generating the low-cost constraint-based transportation plan, tendering the load, receiving carrier confirmation, tracking and monitoring shipments in real-time, and analyzing your carriers and your freight costs to detect areas of improvement.

By gaining more accurate and timely visibility into this critical information, organizations are able to exponentially improve the flow of data and information within their supply and demand chains and logistics organizations to proactively manage the flow of goods and minimize the additional cost of expediting late orders.

**Analytics** – This feature captures complete shipment history for analytic analysis of performance and costs. It allows integration of information, analyses, and analysis tools to help decision makers prioritize their transportation needs. The function of this feature is to inventory information and other transportation features; collect, analyze, and summarize data; identify and track performance measures; identify needs and help determine strategies and actions to address those needs; and monitor and evaluate the effectiveness of strategies and actions that are implemented.

**DO YOU REALLY NEED A TMS IN YOUR ORGANIZATION?**

There is never a clear answer for this question and customers are always grappling with the timing for investing in a system. In an economic low period, typically we see customers reducing IT Spend and are postponing IT purchases. We turn the question completely around and asking ‘Can you afford to not have a complete visibility of your business?’

However, it is important for customers to keep in mind a few things while making that decision:

1. **Transportation becoming a key spends area:**
   For many industries, transportation is the key to ensuring that products are available in customer
markets at the right time. However, as company operations become larger and the number of service providers and fleet size increasing, the entire transportation management activity may become too complex to manage without having a system to manage and provide visibility.

2. Be clear about your objective for getting the system: There have been many occasions when organizations chose complex systems assuming that they will need the entire suite of capabilities including high-end analytics and optimization algorithms. However, their organization may not be mature enough or ready to use such a system. Therefore it is important to be cognizant of the maturity level of the organization and what the objective of procuring such a system is.

The objective may be to set up the basic execution processes which may not warrant a high-end optimization algorithm. The bottom-line being that, it is important to do a Maturity Assessment and set down the objectives.

3. Operational Gaps: In a tough market condition, preserving cash and ensuring that money is not ‘left on the table’ is arguably the most important thing to help ride out the storm. What this means is to ensure that all the inflow and outflow of money in addition to closely managing operational metrics is being done with precision.

To do that, it is important for organizations to have complete visibility of the entire transport cycle including payment. If there is no easy way of managing the transport operation, it may be a good reason for companies to consider investing in a system. The starting point for this, is to understand all the key operational metrics and perform a spend analysis of the transportation costs.

**Benefits of a Transportation Management System**

To make a decision to invest into a TMS, it is important for Executives to be aware of the business case for such a system. Typically, a TMS delivers the following benefits:

- By providing visibility of the consignment through a track-and-trace mechanism to customers and the service provider, a TMS enables better service levels which directly has an impact on key supply chain indicators such as Fill-Rate, Order Fulfilment
- By providing a single point to track performance of service providers, it makes it easier for Logistics organizations to manage 3PLs better and to rate their performances
- In a country like India where road transportation is based on managing with significant number of ‘spot market’ freight, this system allows capture of information and hence better coordination
- A TMS enables load consolidation by providing visibility to all the loads that are emanating from/to a particular location. Since freight rates are usually based on Full Loads or Part Loads, this has a direct impact on profitability for a 3PL and reduced costs for a Logistics Organization

**HOW DO YOU DECIDE WHAT TMS TO CHOOSE FOR THE ORGANIZATION?**

With the number of options available in the market, choosing a Transportation Management System can be a complex exercise since every organizations need is different and there are very rarely Commercial-Off-the-Shelf (COTS) applications that can truly meet all the needs of an organization. Hence it may be worthwhile for organizations to look at engaging experts to evaluate and perform an objective assessment of the right TMS for the organization.

Some of the key parameters that need to be kept in mind while deciding on a software system for Transportation Management are the following:

- **Business Functionality Requirements**: Before embarking on the choice of a TMS, it is important for organizations to prioritize and decide on the ‘must-haves’, ‘nice-to-haves’ and the ‘good-to-haves’. The list of features and functionality outlined earlier can be used as a guideline for deciding on the best features for the specific organizational needs
- **Total Cost of Ownership**: There have been many occasions where companies have invested in software systems based on a short-term view of the costs that they are incurring. However, there may be other costs that were not considered that would kick in during the lifetime of the software. Total
Cost of Ownership needs to consider at least the following costs:
- Licensing Costs per User (must consider the user base growth rate)
- Infrastructure requirements (Database, Server)
- Maintenance Costs
- Training and User Involvement Costs

- **Customer References and Local Support**: One of the best indicators for deciding to invest in a system is the activity undertaken by the competitors. If your competitors are investing in particular systems, there probably is a strong reason for that. This is usually a big clue to how the industry is changing and what external forces are driving the change. Also, the number of installations in the country is an indicator of the vendor’s commitment to long term and local support to customers which may become critical for a growing organization.

- **Integration to other systems**: A Transportation Management System by itself may not be able to fulfill all the needs of a company. Hence it is imperative that the system chosen can be integrated with other Enterprise Applications primarily an ERP or Financial Accounting Systems. As a result we find that many of the mainstream ERP vendors are offering TMS as part of the functionality.

- **Ease of Use**: While companies are quick to look at the mainstream vendors for their TMS needs, it is important to keep in mind that in India, the Transportation Industry is a fairly technology phobic industry as of now. Hence it is important to have an easy to use system for a successful implementation.

## Key Vendors

The transportation management system (TMS) market continues to be led by i2 Technologies and the Oracle Transportation Management (OTM) product; however, several vendors are closing the gaps and gaining on the leaders. Below is the comparative study of the key vendors:

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Product Evaluated</th>
<th>Strong Points</th>
<th>Shortcomings</th>
<th>Market Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infor</td>
<td>Infor SCM Transportation Management</td>
<td>Multiple deployment option, proven functionality, legacy customer base from Basic, Arzon.</td>
<td>Heterogeneous product architecture, carrier management, freight payment, internationalization</td>
<td>Contenders</td>
</tr>
<tr>
<td>JDA</td>
<td>JDA Transportation and Logistics Management</td>
<td>Procurement, Freight payment, Analytics</td>
<td>Not good for 3PLs, legacy product architecture</td>
<td>Strong Performers</td>
</tr>
<tr>
<td>LearLogistics</td>
<td>On-Demand TMS</td>
<td>Operations outsourcing services, partner collaboration, carrier benchmarking</td>
<td>Complex optimization, multimodal planning, lack of internalization</td>
<td>Contenders</td>
</tr>
<tr>
<td>Manhattan Associates</td>
<td>Manhattan Associates TMS</td>
<td>Driver dispatch-optimization and execution, WMS integration, procurement</td>
<td>Parcel, air and rail support, limited international market presence</td>
<td>Strong Performers</td>
</tr>
<tr>
<td>Oracle</td>
<td>Oracle Transportation Management (OTM)</td>
<td>Ground transportation planning, freight payment, implementation services, product strategy</td>
<td>Managing asset based fleets, global trade management, lack of tail deployment option</td>
<td>Leaders</td>
</tr>
<tr>
<td>RedPrairie</td>
<td>RedPrairie TMS</td>
<td>Continuous planning and optimization technology, parcel capabilities, fleet management system</td>
<td>Longer, costly implementations, limited procurement capabilities, call support</td>
<td>Contenders</td>
</tr>
<tr>
<td>SAP</td>
<td>SAP TM&amp;L</td>
<td>Global reach, event management solutions, partnership strategy</td>
<td>Integration with WMS, Analytics</td>
<td>Contenders</td>
</tr>
</tbody>
</table>

Table – Comparative study of the TMS vendors (Source: The Forrester Wave™: Transportation Management Solutions, Q1 2008, Patrick M. Connaughton)

While these vendors have typically been extremely successful in providing solutions for global customers, India has been a tough battleground for the simple reason that most enterprises that require Transportation Management solutions are still in the growth phase and cannot invest in a ‘high-end’ system. In fact, many of the vendors mentioned do not even have a strong presence in the Indian market. Oracle, SAP and i2 have been making steady progress in the Indian market with Oracle showing most promise.

So while the mainstream vendors are slowly showing interest in India, there are a large number of ‘niche’ vendors who have been creating solutions for the logistics providers and corporates requiring transportation solutions. These have been specifically built keeping in mind the SMB market in India. While they may not be as strong in ‘Optimization’ algorithms, there are quite a few of these vendors who can provide excellent ‘execution’ solutions.

While it is not in the ambit of this paper to list out these vendors, Aqua MCG can help customers select the right vendor that meets their specific needs.
TRANSPORTATION MANAGEMENT SYSTEMS IN INDIA: WHAT WORKS HERE?

India as a large diverse nation has complex logistical needs which are further supplemented by the nature of the worker class in the industry and also the practices in the industry till now. The industry is starting to see a transformation in the way global practices are being introduced. These will have definitive impacts on the way technology is being leveraged.

Aqua MCG believes there are still a few key trends that will be seen in the choice of Transportation Management Systems.

1. **Niche Transportation Software and Custom-Built solutions will continue to be popular along with the mainstream vendors:** Until the mainstream vendors such as SAP and Oracle are able to customize their solution and their pricing to suit Indian logistics players, the trend towards building a custom solution in-house or using a niche solution from an Indian vendor who has a solution that can cater to the nuances of Indian business will continue to be prevalent. It is expected that the transportation software will be point-solutions that will be integrated to other enterprise solutions like Warehousing Systems, ERP, and Financial Accounting Systems.

2. **Transportation Software will be a potential candidate for increasing number of Software-As-A-Service (SaaS) solutions:** Indian logistics players are at the crossroads looking at an exponential growth situation in the next few years. However current size of the companies may deter large capital investments in Transportation Software. Though the number of software vendors who offer a full-scale SaaS solution are very less in number, it is expected that an increasing number of vendors will offer this as a cost-effective solution for the Indian firms.

3. **Customers will influence technology investments in Transportation software especially in the visibility and tracking technologies:** As companies start to expect more sophisticated services with better consistency from their logistics service providers, they will require the service providers to be having the necessary technology platforms to offer visibility solutions such as track-and-trace, consignment tracking including international shipments. In this context, logistics companies will look at leveraging Mobility Solutions (GPRS based) and Global Positioning Systems (GPS) for road transportation. High-end technology solutions like RFID may become more prevalent in the long term though the adoption will be slower in the short term.

4. **Transportation software will be first used for execution activities rather than for optimization:** Indian customers and logistics providers will aim to leverage transportation software firstly for execution (carrier selection, route scheduling, visibility) rather than for optimization (route planning and fleet optimization) since most customers (especially the medium enterprises) are yet to set up the basic technology platforms to run their operations.

**KEY TAKE-AWAY**

- Know your need before investing in a software system such as a TMS. Engage experts to help in the decision.
- Be clear on what functionality is required from the TMS suite and how it fits in with the overall IT Strategy of the organization.
- Consider integration needs as an important factor while making the decision for a TMS especially in the Indian scenario where some ‘home-grown’ solutions for Visibility may still be prevalent.
- Look at overall Total Costs of Ownership rather than just licensing costs. Use expert help to articulate a business case for the software.
AQUA MCG SERVICES FOR TRANSPORTATION MANAGEMENT SYSTEMS

Aqua MCG believes that Transportation Management Systems will be one of the popular technology investments for companies and logistics providers in India. Hence it is important to take a structured approach to evaluation, selection, project planning, deployment and change management for the implementation in an organization since it is in all probability a key transformational initiative in the customers’ organization that will require careful planning and strong expertise in program management.

Keeping in mind the complexity involved in making a decision of the right software package, Aqua MCG offers consulting solutions to customers to make the TMS decision easier for customers. Aqua MCG uses a structured framework to do a complete evaluation and to map the business requirements of the customer to arrive at a ‘best decision’ matrix. As part of our best practices, we believe that it is important to involve key senior personnel from the Customer organization who will be the champion for the successful deployment of the program.

Aqua MCG in addition brings to the table a strong ecosystem of critical stakeholders – software vendors, system integrators, hosting solution providers who will work with the customer to successfully ensure the implementation of the chosen TMS software. Aqua MCG’s key value proposition to the customer is to provide a single point of accountability to the customer and provide support throughout the implementation lifecycle so that the customer can focus on their key core areas of operations.

Aqua MCG does not attempt to provide a pre-conceived solution to the customer since we believe that each customer’s situation is unique especially with respect to Transportation needs. Hence we bring in our knowledge of the best practices from global companies and of mainstream software vendors to come to a ‘right solution’ for the customer.
For more information, please contact:

**Mumbai:** Ram Mantravadi  Ram.Mantravadi@aquamcg.com
Shiv Kumar  Shiv.Kumar@aquamcg.com

**Bangalore:** Manish K Singh  Manishkumar.singh@aquamcg.com
Gopal Anandan  Gopal.anandan@aquamcg.com

**New Delhi:** Sanjeev Ganesh  Sanjeev.Ganesh@aquamcg.com

**Technology Consulting**

**Mumbai:** Ravi Ande  ravi.ande@aquamcg.com

**Bangalore:** Bibin Shivas  bibin.shivas@aquamcg.com

Or contact us through our website: [Click Here](#)

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- Business and functional leadership, on a BOT model
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