Three Principles of Transportation Optimization

Clarifying Industry Misperceptions to Help Companies Maximize Their Transportation Management System Investment

Executive Summary

Companies are increasingly considering their transportation and logistics operations to be a competitive differentiator. As such, demand for advanced transportation management systems is on the rise. According to Gartner, Inc., the transportation management system market should see double-digit growth in 2011 and a five-year compound annual growth rate of 9.4 percent. With mounting pressure on businesses to contain costs, address capacity constraints, lower their carbon footprints and streamline movements, a flexible, agile and functionally rich transportation management system can help support their service goals.

Yet for some companies, pinpointing the optimal solution can be nearly as complex as getting the right products to the right places at the right time and at the lowest cost. One factor adding confusion to the search is the manner in which vendors use — or overuse — the term optimization.

For more than 15 years, transportation solution vendors have been touting the optimization power that their solutions deliver to support more sophisticated planning, execution and settlement processes. Indeed, optimization techniques are proven to drive the vast majority of the business value realized from the use of transportation management solutions. However, not all optimization strategies are created equal and that’s where the confusion lies.

Vendors too often focus on just one function to optimize, which can lead to more harm than good. A simplified optimization approach may prompt a shipper to pick one carrier over another simply based on cost. A comprehensive approach may reveal that the selected carrier doesn’t have enough trucks or docks available to support the load in the first place.

With the transportation management system market expanding, the time has come to clarify misperceptions and reveal the best practices in optimization. Shippers today must optimize beyond carrier selection and rates to address myriad constraints and granular functions that apply these three key principles:

1. One size does not fit all
2. The details matter
3. Concurrency is king
Three Critical Optimization Principles

Principle 1: One Size Does Not Fit All

With so many constraints and variables, transportation issues can’t be solved with deterministic approaches because the problem gets too large too quickly. For the best possible answer in the shortest amount of time, companies must apply both heuristic and deterministic approaches that use a series of logical and common-sense decisions along with network constraint considerations.

Transportation management systems should offer a flexible configuration that adapts to each company’s unique strategies, as well as network constraints and variables. No solution should apply the same five steps for every transportation problem. The transportation management system should support a wide range of mathematical approaches, allowing users to view problems holistically and then constantly modify those approaches based on current needs and requirements.

Companies that follow optimization best practices constantly monitor and tune their strategies to address any changes in their network, supply chain, market and customer demands. Capacity, for example, tends to ebb and flow with economic changes, and shippers must be prepared to adapt their strategies to capitalize on market opportunities. Rather than letting the transportation management system’s solver run unattended, shippers must always look for ways to drive more value for their businesses.

“Pepsi Logistics Company, Inc. [PLCI] digs deep to find the best solution for every single request that comes our way, which has helped drive credibility within the organization. PLCI saves the company money and offers the best possible transportation solution under PepsiCo’s negotiated rates.”

- Mark Whittaker, vice president of transportation, PepsiCo

Principle 2: The Details Matter

Intertwining planning and execution processes makes transportation functions unique among other supply chain functions. Shippers don’t have the luxury of planning and forecasting months in advance and then balancing any variances as the shipment gets closer. Transportation lead times could be weeks, days or even hours, making planning and execution essentially one and the same. That’s why it is so critical that all of the details – from network and dock scheduling to asset capacity and granularly defined rates – are expertly modeled. The more upfront work that the engine does, the better a company’s plan will be. With no second chances, shippers must make the best decisions the first time in order to efficiently execute and maximize value.

Ensuring accuracy and visibility into all of the details also confirms that a company is not missing out on opportunities to get the same results at lower overall costs. For example, in general truckload routing, a business will incur distance, mileage and stop charges, as well as fees for incidentals such as a lift gate. Upfront visibility into those requirements is essential. If a company is planning a move consisting of three orders, it is far more cost effective to spread the lift-gate charge across three stops than to plan a move with only one stop.

A company must also have visibility into the details of the load that it is moving. While pallets are straightforward enough, what if the load contains loose or oddly shaped products? Rather than making assumptions that can lead to added costs and stoppages, the company needs containerization capabilities to model the load at a finer level of granularity.

“We are using our transportation management solution to create optimal load routings in a fraction of the time by enabling our associates to manage the execution of the optimized plan, rather than focus on the creation of the plan. We are executing ‘apples-to-apples’ comparisons regarding our ability to assess our options to achieve results on demand. We have gained the visibility to quickly assess which options not only meet our customers’ needs, but also provide C.F. Sauer with the greatest operational efficiencies and cost savings.”

- Robby Greenwood, director of transportation planning, The C.F. Sauer Company

Principle 3: Concurrency is King

Shippers must rely on an optimization engine that considers all elements of the problem – strategies, details and levels of granularity – at the same time in order to produce the best answer. Engines that break up the problem or handle requirements in a sequence will not deliver optimal results and could even lead to costly problems.

For example, one transportation management system currently on the market relies on representative rates to optimize loads. This system then considers the detailed rating and carrier selection as a second step. This flawed approach could result in building a bad load in step one by not taking into consideration all of the details up front. When the shipper moves to step two, it could be rating and finding the lowest cost carrier of a bad load. The right approach in this scenario is to consider rating concurrently as the optimization engine is running through its routing strategies. A best-practices transportation management system can consider all aspects of the problem concurrently,
including rating, routing, scheduling and capacity constraints.

Another optimization best practice is to take an iterative approach across a continuum of time. As shippers receive new information and orders, they should use that knowledge to incrementally improve the plan each day. While a company may receive and optimize 1,000 orders on a particular day, only a portion of those orders typically needs to be executed that same day to meet customer requirements. The shipper should add the remaining orders to its planning bucket and mix them with existing and new orders.

Throughout the process of constantly adjusting and incrementally optimizing the orders to be executed, shippers must have visibility across time into already executed orders. This enables them to continually refine any network constraints or carrier commitments. It also ensures that they have the required resources to realize their service goals as efficiently and effectively as possible.

**Real-World Success: Ambev Optimizes Transportation to Reduce Costs and Improve Customer Service**

Ambev, a leading Latin American brewer and PepsiCo International, Inc’s bottler outside of the United States, is a stellar example of what successfully leveraging best-practice transportation and logistics management solutions can deliver in taking business to the next level.

**Additional Ambev Background**

Ambev and its subsidiaries produce, distribute and sell beer, carbonated soft drinks and other non-alcoholic and non-carbonated products in 14 countries (Argentina, Brazil, Bolivia, Canada, Chile, El Salvador, Ecuador, Guatemala, Nicaragua, Paraguay, Peru, Dominican Republic, Uruguay and Venezuela).

The company holds a portfolio of “stars” including the beer brands Antarctica, Brahma, Bohemia, Skol, Original and Stella Artois; the carbonated soft drinks Guaraná Antarctica, Soda, Pepsi and Sukita; and the innovative H2OH! and Guarah! soft drinks.

**Growing Business Volume and Complexity Drove Search for New Solution**

After experiencing a significant spike in order volume across its operating regions, Ambev initiated a search for better transportation solutions that could handle increasingly complex demands from the company’s growing business. In addition to cost and efficiency concerns, Ambev also needed to ensure that customer service levels kept pace with increasing demand. Therefore, the company sought to improve asset utilization and processes while positioning itself for continued future growth.

Following an evaluation of the most relevant systems available in the market, Ambev decided to replace its legacy systems with industry-leading transportation and logistics management technology to better plan and manage its transportation network.

**Optimizing Costs, Assets and Service Levels**

After a faster than expected implementation, Ambev was able to realize 100 percent return on its technology investment in less than 12 months of going live. Ambev can now optimize its transportation network by modeling multiple transportation configurations and combining route optimization with load building to maximize capacity utilization. The company can also synchronize transportation planning and execution with network and inventory constraints. With the solutions simulating real-world scenarios, Ambev can determine the best way to allocate its fleet for reduced costs and optimized use of its 380 trucks. Dock scheduling – which in some cases was previously done manually – can be completed within the new system.

**Business Benefits Achieved**

- 100 percent return on investment in less than 12 months
- Improved network-wide visibility
- Increased asset utilization
- Enhanced dock scheduling, resulting in reduced dock congestion
- Improved customer service while decreasing costs
- Better overall transportation efficiency and performance

“Our transportation management system ensures the best use of our assets. We are able to consolidate loads and use maximum capacity in our trucks while still respecting weight restrictions. We also have streamlined activity at the dock since we're able to efficiently conduct dock scheduling. Plus, we no longer have to worry about tariff management and know that we will have the right choice of carrier offering the best cost for each trip.”

- Erik Novaes de Almeida Silva, transportation and project manager, Ambev

** Buyers’ Checklist: 10 Transportation Optimization Capabilities**

Whether a company spends $10 million per year on freight or budgets millions of dollars for a multi-modal, global logistics network, that organization must invest in a transportation management system that meets its existing and future needs. That means selecting a partner that
delivers functional breadth and depth along with flexibility, scalability and expertise.

To set companies on the right path, JDA Software offers its list of top 10 optimization capabilities to more effectively contain costs, reduce miles and increase utilization efficiency:

1. Adjust heuristics and strategies to drive value specific to the network
2. Evaluate actual and not representative carriers’ rates, including assessorial charges
3. Create a detailed network schedule that accounts for the varying transit measurements across modes
4. Model dock capacity and create a detailed dock schedule
5. Enable the concurrent modeling of private and dedicated assets with commercial freight, including domiciles, tractors and trailers
6. Maximize loading efficiency by leveraging containerization algorithms
7. Iteratively plan across a continuum of time
8. Consider asset capacity and commitment constraints across multiple optimizations
9. Support the dynamic consideration of concurrent routing strategies, including multiple hub routing, multi-pick and drop, as well as continuous moves
10. Solve large-scale volumes across an entire network and over a wide time horizon within a reasonable timeframe

Conclusion

During an era where profitability and cash flow are under extreme scrutiny, companies cannot afford to settle for less than optimal returns from their transportation and logistics operations. This fact becomes even more critical if competing organizations are already relying on transportation management systems that apply the industry’s best optimization practices. The right solutions can drive significant business results and boost competitive position. These sophisticated transportation management systems are highly configurable and flexible, can handle processes concurrently and provide upfront visibility into all relevant details.

About JDA Transportation & Logistics Management Solutions

For more than 25 years, JDA Software has helped the world’s leading retailers and manufacturers strategically advance their multi-modal global logistics networks. The JDA Transportation & Logistics Management solution suite features a broad footprint, rich functionality and unparalleled scalability. These comprehensive solutions, including the market-leading solutions developed by i2 Technologies® and Manugistics®, effectively manage an entire closed-loop transportation process, from long-range strategies and operational planning to day-to-day execution. JDA’s integrated yet modular solution set is proven to help companies improve sourcing, planning, optimization, shipment visibility, payment and performance analysis initiatives.

About JDA Software Group, Inc.

JDA® Software Group, Inc. (NASDAQ: JDAS), The Supply Chain Company®, is the leading provider of innovative supply chain management, merchandising and pricing excellence solutions worldwide. JDA empowers more than 6,000 companies of all sizes to make optimal decisions that improve profitability and achieve real results in the discrete and process manufacturing, wholesale distribution, transportation, retail and services industries. With an integrated solutions offering that spans the entire supply chain from materials to the consumer, JDA leverages the powerful heritage and knowledge capital of acquired market leaders including i2 Technologies®, Manugistics®, E3®, Intactix® and Arthur®. JDA’s multiple service options, delivered via the JDA® Private Cloud, provide customers with flexible configurations, rapid time-to-value, lower total cost of ownership and 24/7 functional and technical support and expertise.

Endnote: