FEATURE ARTICLE:
EVOLUTION OF TRANSPORTATION MANAGEMENT SYSTEMS
by Gurram Gopal

While the consumer might bemoan high gasoline prices while driving to the local grocery store to pick up packaged goods, transportation costs can range from 3 to 7 percent of sales for companies\(^1\). This can amount to millions of dollars for large firms like Proctor and Gamble. Consequently, companies have been seeking opportunities for cost savings within transportation and logistics. As companies have decentralized operations and let operating divisions make their own transportation choices, it is not uncommon to find different divisions using different carriers on a single lane and not consolidating shipments. Thus, consolidating transportation services is often a company’s most obvious opportunity for reducing spending on logistics. This has led many shippers and third party logistics providers (3PLs) to deploy Transportation Management Systems. These systems are client-server based software systems that allow the user to optimize shipments and loads for lowering costs and maximizing capacity utilization. In addition to reducing direct spending on transportation services, Transportation Management Systems (TMS) offer users opportunity for improvement in the following areas:

- **Process Improvement** – As part of a TMS implementation, logistical processes including receiving and shipping processes are often redesigned. Transportation functions including shipment planning, carrier selection and tendering, can realize improved productivity. Logistics staff can spend less time on “expedites” and focus on better planning. They can assist other functions like R&D in considering logistical requirements during the product design and development stages.
- **Shipment Optimization** – Advanced consolidation capability allows for efficient, multi-stop inbound and outbound shipments, as well carrier pooling capability.
- **Continuous Moves** – TMS allows for planning continuous moves with core-carrier programs which improve utilization rates and service and also lower costs.

All of the above advantages have been well known, and historically were compelling enough for companies to consider purchase of such systems. However transportation management has become more complex than even five years ago. Companies have reached beyond the challenges of managing regional operations, and have sought solutions for a smoother, global supply chain. While the advantages listed above focus on cost savings, these systems have evolved to support tracking movements across multi-modal transport, and on better satisfying customer demand through increased product visibility. With the maturing of the Internet, users throughout the supply chain can now participate in the movement of goods and services, either through company-owned web portals or through third-party portals.

**System Integration**
As supply chain systems mature, so must TMS. Specifically, the ability to integrate a TMS with other pre-existing systems such as Warehouse Management Systems (WMS)

\(^1\) [http://www.worldtrademag.com/CDA/Archives](http://www.worldtrademag.com/CDA/Archives)
or Enterprise Resource Planning systems (ERP) is often required. Optimization in transportation management can still result in bottlenecks should warehouse management or surrounding systems not be considered. For example, attempting to achieve optimized truckloads can result in increased ‘dwell time’ at the warehouse. These factors, coupled with inter-modal transportation congestion and international legal and security demands, require that a company’s systems work in an integrated manner to plan logistics and deal with (and make sense of) exponentially greater amounts of data. Paul Svindland, Director of Transportation and Logistics at ICG Commerce (a procurement services provider based in Jenkintown, Pa.) addressed this issue when talking about one of his clients, “…Their (company’s) sole focus was on getting better transportation rates. Now, they want to know how TMS meshes with ERP and other components of information technology, . . .they want to understand the true value of TMS1.”

The tragedy of 9/11 has pushed some TMS vendors to improve tracing and cross-border trade capability. A good example of this is UPS’s recently launched product known as TradeAbility2. With this online service, UPS allows shippers to determine transportation costs, duty, taxes, and any compliance issues for dozens of companies. As companies seek to take advantage of globalization, UPS hopes to service them with its international transportation expertise. Alan Almling, Director of International Forwarding and Customs Brokerage Services at UPS explains it simply as, “We’ve staked our future on globalization.”

According to Robert Bowman of SupplyChainBrain.com, globalization has a dual-pronged effect on the supply-chain systems:

1. Companies are increasing reliance on strategic sourcing with overseas vendors.
2. Companies are forced to sell in new regions of the world to achieve top-line growth.

This means that transportation execution increasingly comes from more than one provider. However, depending on the industry, the level of information gathered and used can vary widely. Currently, software managing the movement of goods with ocean and rail carriers lags behind the capabilities of TMS applications for trucking. This has only been complicated further by a recent ruling by the U.S. Federal Maritime Commission allowing Non Vessel Operating Common Carriers (NVOs) to enter into confidential contracts directly with ocean carriers. Greg Aimi3 of AMR Research speaks to this new development by stating that “Contract parties will need procurement optimization, rate and service databases, access to sailing schedules, and settlement features.”

1 Supplychainbrain.com
2 UPS Website.
3 Supplychainbrain.com
Which TMS is Right?
ARC Advisory Group\(^1\) estimated the TMS market at approximately $950 million in 2005. The greatest driver for TMS, according to the same report, was the need for better visibility and control of financial performance.

The TMS marketplace can be categorized into three groups. Large ERP vendors like SAP and Oracle are leveraging their presence as the core enterprise system in many corporations and are providing TMS as part of their ERP suite. Another group consists of stand-alone (best of breed) TMS providers like Niestevo, Descartes, Logility and Manhattan Associates who provide TMS with capability for integration with other systems. A third group that has emerged over the past two years consists of vendors like High-Jump, Transplace, and LeanLogistics who offer on-demand, pay as you go access to TMS that often requires just a browser and Internet access. Often included in this group are third party logistics companies and freight forwarders that offer customers access to their TMS systems. The price of traditional TMS ranged from $50,000 to several million dollars in 2005, depending on the product and scope of implementation\(^2\). Probably the best indicator of the trend in TMS is that vendor fees for license software have remained flat, while revenues from subscriptions, transaction fees and other recurring sources have experienced double-digit growth\(^3\). It is now feasible to bypass the issue of TMS application expense by accessing the 3PL applications. Tom Madzy, CIO of Seko Worldwide, testified to this growth when he described his firm as, “…much more of a technology company than a transportation company.” He continued, “Most TMS services (at Seko) are provided at no charge, making the option that much more compelling.”

In the same report cited earlier ARC Advisory articulated the following strategic issues surrounding the “on-demand” discussion.

- What impact will On Demand and “pay as you go” pricing have on sales of traditional TMS?
- Will Logistics Service Providers steal customers and cannibalize sales from traditional TMS systems?
- How can vendors penetrate the small and mid-size market?
- Is Service Based Architecture (SOA) a fad, or is it making a difference?
- Is a “domestic-oriented” TMS becoming outdated as globalization gains momentum?

TMS as an “On Demand” Service
The success of “salesforce.com” in providing the Customer Relationship Management application as a service has initiated new trends in many applications, including TMS. In this model, a software vendor will host the application and the client accesses the application using either the public Internet or a private network, often using a browser. Clients are billed on a ‘subscription’ model, often based on the number of users accessing

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\(^1\) [www.arcweb.com/research/ent/tms.asp](http://www.arcweb.com/research/ent/tms.asp)

\(^2\) Bridget McCrea, *Logistics Management* 45(2): 45-46

\(^3\) ibid
the application during a given period. Typical contract terms are for 12 months or less. The promise of such a system is fast deployment, minimal IT involvement, and lower up-front costs. According to Beth Enslow, Vice President of Aberdeen Group, the results of a recent survey indicated that of the respondents who said they were considering buying a TMS within the next 18 months, 40 percent planned to seek an on-demand solution. LeanLogistics is one vendor that sells an on-demand TMS and provides managed transportation services. It claims that many of its clients are up and running in 45 to 90 days with minimal IT involvement, much faster than the four to six months or more required for a client-server TMS implementation. Because it is a hosted TMS platform, clients of on-demand TMS benefit as carrier connections are already established. Another benefit of this model is that users can easily access the system and share data across their enterprise. The average customer, LeanLogistics estimates, has eight users accessing shipment status, cost, and other data. Value is added for the shipper as the TMS service providers have moved from a tracking-based application to a resolution management system. For example, in case of a bottleneck the TMS service generates event driven notifications and enables messaging collaboration so corrective action can be taken. The messaging systems can include the popular Instant Messaging applications accessed and used by corporations. If a shipment is late or is damaged the shipper has visibility and can move quickly to resolve the issue.

The success of a collaborative system that operates on a single platform hosted by the vendor (or a 3PL) depends in part on the number of participants. As more customers sign on with the ‘TMS as a service’ provider there is greater opportunity to share information across trading partners and even between other shippers. Some of these systems even allow freight to be consolidated should separate shippers decide to optimize a load together.

In summary, while the promise of lower logistics spend with increased visibility in the supply chain makes TMS a compelling offering, have these solutions truly made a significant difference and delivered on their promises? If one looks at adoption rates as an indicator, AMR Research estimates that 30% of manufacturers and distributors are currently using or implementing TMS software, with another 30% planning or willing to consider TMS in the next 12 to 18 months. While companies have realized savings of 5 to 15% on their transportation spend using these solutions, TMS solutions remain low on the radar screen of corporate CIOs. A future article will deal with implementation issues associated with TMS solutions, and will outline best practices for developing a sound ROI model before ‘driving’ a TMS solution.

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COMMENTARY:
INDUSTRY AS DEFINED BY GROSS DOMESTIC PRODUCT (GDP)

The Gross Domestic Product (GDP) = Accumulative Value of All Products and Services

Each sector of the economy’s contribution to the GDP is the value of the products or services provided less the expenditure for materials and services. The Bureau of Economic Analysis of the U.S. Department of Commerce published 2005 data on the GDP contribution of various sectors of the economy.

U.S. GDP = $12.5T

$T = $1000B = $1,000,000M

Private Industry contributes $10.9T

Governments contribute $1.6T

The GDP based on goods production is: $2.5T
  - Agriculture = $0.1T
  - Mining = $0.2T
  - Utilities = $0.2T
  - Construction = $0.5T
  - Manufacturing = $1.5T

The GDP based on services is: $8.4T
  - Wholesale Trade = $0.7T
  - Retail Trade = $0.8T
  - Transportation and Warehousing = $0.4T
  - Information = $0.6T
  - Finance, Investment, Real Estate, etc. = $2.6T
  - Prof. & Business Services = $1.5T
  - Education and Health Care = $1.0T
  - Arts, Entertainments, etc. = $0.5T
  - Other = $0.3T

One often hears about the U.S.A. being a service economy – the above is the basis as taken from the North American Industry Classification System (NAICS).

An alternate approach is to consider industry as those sectors of the economy that make and get ‘stuff’ to companies and to individuals. The stuff that is made includes output from manufacturing and construction. Wholesale trade as well as transportation and warehousing are also clearly involved in getting the “stuff” to the end user. The GDP represented by industry as defined above would be $3.2T. Industry as defined in this way represents over 25% of the U.S. GDP.