



From Visibility to Action

Year 2004

Report
on Trends
and Issues
in Logistics and
Transportation

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From Visibility to Action

Year 2004 Report on Trends and Issues in Logistics and Transportation

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Table of Contents

Introduction	1
From Visibility to Action	2
Six Drivers of Fulfillment	4
What We face - the State of the Competitive Environment	6
How Much Visibility?	15
State of International Supply Chains	19
Our Collective Point of View	21
What it Means to Us	25
The Authors	26
About the Participants	27
Contact Information	29



Introduction

Oracle Corporation, Capgemini and Georgia Southern University are pleased to present this report drawing from the results of our 2004 research on trends and issues on supply chain, logistics, and transportation. This report marks our 13th annual examination of the topics that challenge managers on an on-going basis in the conduct of their business. We would also like to thank and acknowledge the input of Dr. Mary Collins Holcomb at the University of Tennessee.

Over the last few years firms have been working on means to increase visibility in their organizations. This quest for visibility continues as firms wrap their supply chains across the globe. Events over the past three years have only heightened our awareness - and need - for accurate information in a real time basis.

As early as 2000, we were advocating the value of transforming the organization to a more adaptive, flexible entity. The findings of our 2003 study indicate that much work remains to be done to develop adaptive supply chains. In last year's report, we stated that the fundamental starting point was visibility. In this year's report we are building on this foundation by examining the role and significance of visibility in logistics and across the supply chain. While logistics visibility focuses at the tactical level, supply chain visibility is the alignment and leverage of processes and procedures across multiple organization. Visibility that extends beyond the firm is what will enable firms to compete "supply chain to supply chain."

The importance of visibility and the improved control implied in this term is manifesting itself in the US Department of Defense, Wal-Mart and others around the globe demanding that suppliers adopt RFID as a data collection technology. Findings from the current study indicates that corporate executives are continuing to focus on the supply chain as a key differentiator and strategic function. The implication is that we are entering another phase of change where data collection and synchronization, together with extended supply chains, will challenge the respondents to do even more to boost global visibility. The name of the game in visibility is "actionable information." How do we collect vast amounts of detail through an increasing variety of tools (e.g. RFID) and filter it for presentation in near-real time in a form that can be responded to?

Actionable information should lead to quantifiable results and our research bears this out. Those firms that reported higher levels of visibility in their domestic supply chains experienced better inventory turns, days sales outstanding and days sales in inventory. Supply chain visibility is contributing to the bottom line.

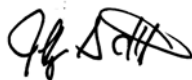
This year's study offers an assessment of the state of internal and global supply chain visibility, along with perspectives on what is emerging in the form of actionable information.

Yet, more needs to be done. Overall logistic performance has remained relatively flat over the past several years. This is not due to the lack of tools that have been implemented. Rather, it is a symptom of not integrating and leveraging the tools to provide optimal solutions.

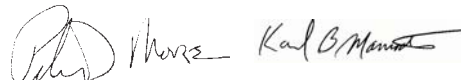
This research and resulting report would not be possible without the continued support of the study's participants. We would like to thank these professionals for taking time out of their busy schedules to share with all of us their expertise and insights.

We hope you find this report helpful as you continue the process of devising, reviewing, and improving supply chain management initiatives within your company. They all should be evaluated against the end-goal of an adaptive cross-enterprise collaborative supply chain; one whose efficiency is only matched by its effectiveness.

Sincerely,



Jeff Abbot
Senior Director,
Oracle Supply Chain Applications
Oracle Corporation



Pete Moore
Vice President
Capgemini

Karl B. Manrodt, Ph.D.
Associate Professor
Georgia Southern
University

From Visibility to Action

Our 2004 study, *From Visibility to Action*, is an analysis of current trends in logistics and supply chain management. Based on survey responses from more than 500 logistics professionals, the study emphasizes the benefits of creating visibility in the firm through key supply chain processes.

Results of the study have been arranged in three major sections. The first section, *Six Drivers of Supply Chain Excellence*, briefly examines six key characteristics that drive a transformation to greater efficiency in supply-chain, logistics and distribution processes. These drivers -- Collaboration, Optimization, Connectivity, Execution, Speed, and Visibility -- are the benchmarks we used to evaluate the progress of our survey participants in achieving logistics excellence. Last year's report focused on operations excellence, the foundation for developing responsive supply chains. This year's study focuses on the state of supply chain visibility as well as its barriers and enablers.

The second section of this report, *From Visibility To Action*, discusses the challenges facing firms in global supply chain visibility. This section consists of three parts: challenges in transportation, domestic versus international visibility and metrics. We will report on the current status as it relates to overall supply chain visibility, and some of the gaps firms are now experiencing.

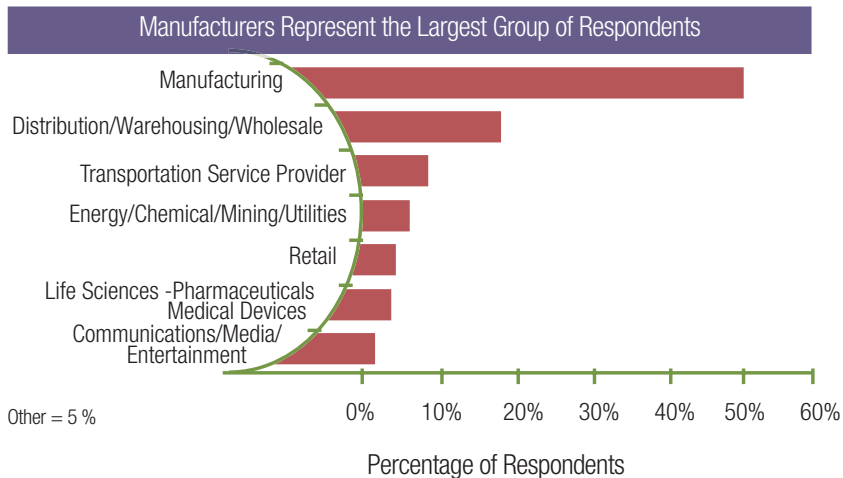
Finally, we conclude with our *Point of View*, which highlights the authors' perspective on the results of this year and offers recommendations for the future. This year's *Point of View* adds a second dimension - an analysis of the key findings from the perspective of the authors in consulting, software and academics. Each of these perspectives provides an assessment of the current state, and more importantly, suggests future direction for achieving the desired end state in logistics and supply chain excellence.

Participant Profile

This was a banner year for the study - for the first time over 500 professionals (503 to be exact) participated in the study. Aggregated as a profile group, around two thirds of the companies who responded have annual revenues under \$1 billion (68 percent), while those with annual sales of \$1-3 billion accounted for 13.0 percent of the sample. Those firms with sales greater than \$3 billion were 18.8 percent. Compared to last year, there was an increase in the percentage of firms with revenues less than \$1 billion completing the survey. However, the actual number of respondents in this category is the same as last year.

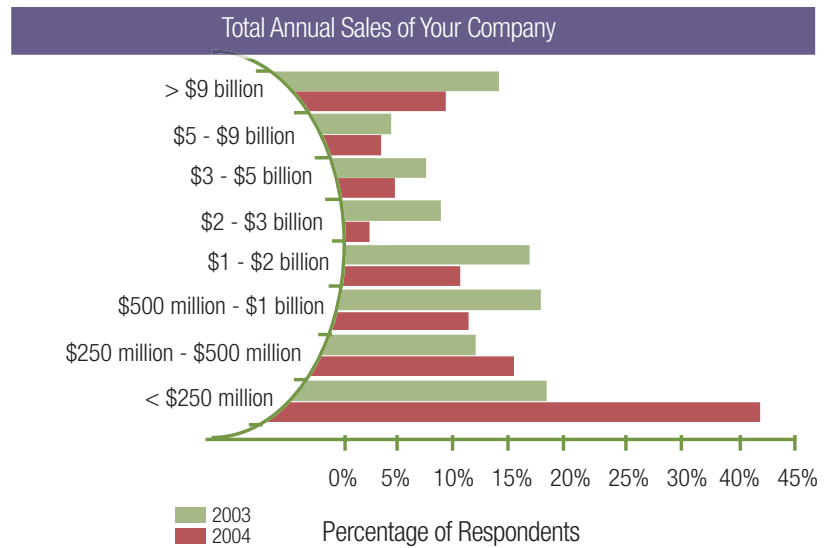
The firms that participated in this year's study also command a great deal of attention in that they account for more than \$43 billion in annual spending on transportation. Collectively they have a significant impact on current and future trends in logistics and supply chain management.

Exhibit 1



While all industrial sectors are represented in this study, manufacturers led in survey responses, comprising 50.6 percent of the survey sample. This is a decrease compared to last years' results of approximately 60 percent. An additional category was added this year - Distribution / Warehousing; nearly sixteen percent of the respondents described themselves this way. The next largest sector was Consumer Products.

Exhibit 2



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Six Drivers of Fulfillment Excellence

A Look Back

Starting in our 2000 report *Logistics @ Internet Speed*, we introduced the six drivers necessary for achieving logistics and supply chain management excellence. We suggested that customer demand and technological advances would provide greater visibility and control in supply-chain, transportation and distribution activities.

As we closed out 2001, many asked if any of the six drivers were more critical than another. That is, if you could only focus on one or two, what would they be? In 2002 we responded with the need for supply chain managers to focus on visibility in their supply chain. Visibility is more than just a tactical supply chain issue; it can have profound strategic implications for the entire organization. It sustains, accelerates or enables the other drivers. Without true visibility, the firm is hindered from achieving agility in a volatile world. This lack of responsiveness leads to a sub-optimal supply chain that often diminishes the effectiveness and efficiency.



A Look Forward

The emphasis on visibility has not waned over the past two years, as events on the domestic and global stage have increased the need for visibility in the form of actionable information. Four such events are noted below.

First, the full implementation of Sarbanes - Oxley will increase the need for internal operational visibility. Chief Officers of the company now must certify as to the financial and non-financial performance of the company based in part on information derived from their systems. Firms will have to disclose on a “rapid and current basis” and “in plain English” any material information concerning changes to their condition or operations which the SEC may determine is necessary. Thus, there is a real need for the “CXX” executive to know with certainty that the supply chain that is promised to deliver the next quarter’s projected results is really capable of doing so.

Second, global security is pushing farther and farther back in the supply chain. Farther back means collecting information about each shipment on each leg of its journey to the United States. For instance, this means clear visibility on each shipment as it originates in Pakistan, moves to Singapore and heads for Savannah.

Third, global trade continues to increase. This trend is not expected to slow in the near future. Companies are sourcing raw materials based on quality and cost, not the location of the supplier. Some have suggested that the elimination of some trade barriers with China in January 2005 will release a floodgate of products into the domestic market. As such, increased trade has accelerated the need for greater visibility to ensure a safe and secure supply chain .

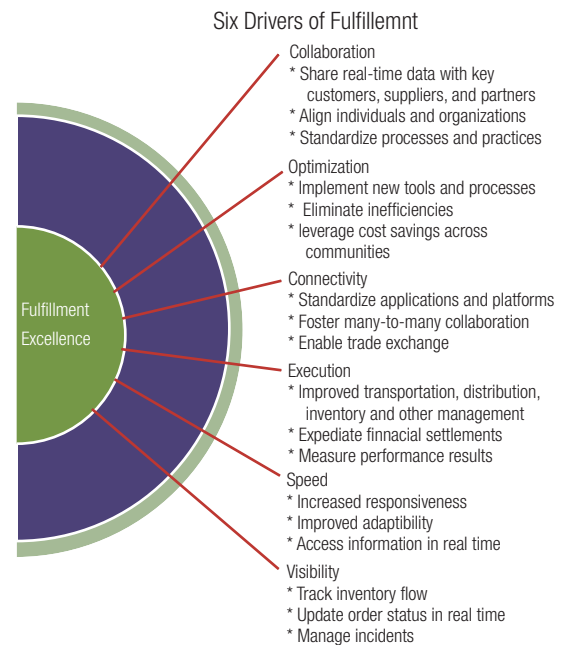
Finally, the impact and threat of terrorism requires logistics and supply chain professionals have alternative plans ready for implementation. There must be visibility as to where products are, as well as the capability to have agents (people and technology) act efficiently to keep them flowing. A increase in new data sources must be balanced with data synchronization and data management to enable logisticians to perform at high efficiency, regardless of the environment.

What does it all mean for logistics professionals today? Managers:

- ❑ must manage information impeccably inside the enterprise-and must strive for better visibility beyond the four walls;
- ❑ must receive better information from logistics providers, who are a vital partner to their supply chain success; and,
- ❑ must be able to track throughout the process (e.g. from order, to picking, to shipping, to delivery).

In other words, perfect information, perfect execution, and perfect orders.

Exhibit 3



“We need to have total visibility throughout the supply chain. The better the information, the better our targeting will be.”

Robert C. Bonner
Customers Commissioner
Speech at the Heritage Foundation
July 15, 2004

What we Face - The State of the Competitive Environment

Changing Customer Expectations

Past research has indicated that our best customers expect the best from us. They order more frequently than an average customer, and for the most part receive a higher level of service.

Unfortunately, the transportation infrastructure by which we serve the entire customer base is facing significant change. For the first time in the history of the study, service levels in critical areas have dropped.

Exhibit 4

	Mode of transportation	2004	2003
Average Billing Error Rate	TL	4.7 %	2.4%
	National LTL	3.7%	3.0%
	Regional LTL	3.4%	2.2%
	Rail	2.2%	4.9%
	Express Package	2.9%	2.5%

Billing error rates is defined as the number of billing errors divided by total billings. What is significant is the increases that were seen in all but one mode of transportation. This is even more noteworthy given the technological strides carriers have made in recent years.

Exhibit 5

	Mode of transportation	2004	2003
Average Freight Loss & Damage	TL	3.9 %	1.0%
	National LTL	2.6%	1.5%
	Regional LTL	3.6%	1.5%
	Rail	2.3%	1.2%
	Express Package	2.1%	0.8%

Respondents reported increased freight loss and damage over last year. In a supply chain where products are to be delivered just in time, with little safety stock, this year's finding adds more complexity for logistics professions: how to respond to the increased potential of damaged or missing freight?



Finally, carriers are struggling to deliver shipments on time. Hampered by increased demand, capacity constraints and a driver shortage, carriers' on time performance declined. Rail managed a slightly better level of performance, but is still well below that of motor carriers. The express package segment stayed relatively unchanged.

Exhibit 6

	Mode of transportation	2004	2003
Average	TL	95.0 %	96.8%
On Time	National LTL	92.4%	94.3%
Delivery	Regional LTL	95.5%	96.2%
Performance	Rail	85.4%	84.1%
	Express Package	96.3%	96.2%

One might suspect that the statistics are different for smaller customers - that is, those companies with sales under one billion dollars would have experienced worse service than the larger firms. Yet, comparing companies with sales under one billion to those with sales greater than three billion reveal very few differences. In other words, both large and small shippers are experiencing lower levels of service as compared to previous years. What does this mean? Everyone is experiencing lower carrier performance. And, this pain is being spread across all customer groups.

Challenges in Transportation

As noted above, there are several explanations for lower service performance metrics. First, capacity is very tight. The slower economy over the past few years has masked the impact of equipment availability.

And, even if the equipment were there, firms still face another problem - finding drivers to put behind the wheel. This shortage is expected to increase pressure on increasing rates.

Third, carriers are facing rising fuel costs. One study has shown a significant correlation between fuel costs and bankruptcies; as fuel costs go up, so do carrier failures. It will be interesting to see the results as the cost of crude continues its upward climb; perhaps one saving factor in this equation is the tight capacity issues noted above.

Fourth, shippers are working to "lean" their supply chain. This requires more frequent deliveries of smaller lot sizes, and greater communication between suppliers, customers and the carriers. Any errors in execution can disrupt the fragile flow of goods to the market place.



Finally, Hours of Service rules passed last year after nearly a decade of work were “vacated in their entirety” as the U.S. Court of Appeals viewed the new regulations as being “arbitrary and capricious.” Over 46% of our respondents said that HOS rules would significantly impact their operations. The uncertainty, as we near the busiest season for carriers, can only serve as a leverage point to rationalize higher rates.

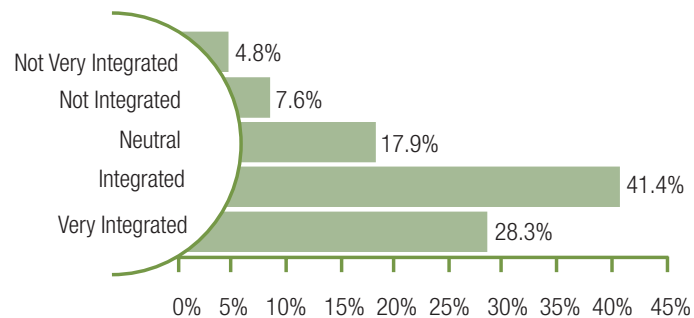
Challenges in Integration

Love is often said to be in the eye of the beholder. It seems that integration of logistics and transportation is also in the eye of the respondent. The message received by our respondents was at best blurred.

Survey participants were asked to describe how integrated transportation and logistics were in their division. As noted in the graph below, nearly 70% of the respondents reported that these two areas were integrated to very integrated.

Yet, previous studies have not shown this level of integration. For instance, the integration of TMS and WMS packages had the lowest level of integration just three years ago. Given the lack of resources, and the reduction of spending in software of the last several years, it would be hard to explain where or how these areas were integrated.

Exhibit 7



These findings raise a fundamental question: are firms that report higher levels of integration better at managing their inventory? After all, why invest money to integrate these functions if there won't be a return on the investment?

The results, unfortunately, are not positive. While inventory turns are higher for those that report higher levels of integration, it is not statistically significant. What this hints at is the true complexity of integrating the firm on key logistics processes, and how many different definitions we all have for the word “integration.”

Logistics managers can take some solace in the fact that conventional issues still exist-carrier capacity constraints, uncertain new regulations and rising fuel costs. Why take solace? Because these are the same issues that, over the past fifty years, have always leveled the playing field. It is the effort required to implement best practices that is providing great opportunities for some and terrible nightmares for others.

For example, a shipper that has thrived on sweat and highly manual efforts to win business is now faced with an environment where that's just not good enough. Integration for this group is the ability to "pick up the phone any time and know where my freight is." They struggle perhaps because their workforce is not adept to the internet based technologies or automated workflows their competitors are embracing. While solutions may have been put in place to make the firm more efficient, they have not (and cannot) do so without buy-in from all levels of the organization. The phone call needs to be replaced by the web and actionable information. Leading shippers and providers see this as a competitive weapon and the numbers support their position.

A majority of the respondents viewed themselves as having integrated transportation and warehousing departments. Yet, information / data accuracy and availability, along with supply chain visibility, were the important areas that respondents said they would be working on this coming year.

Exhibit 8

Factor	Mean
Information/data accuracy and visibility	1.7
Supply chain visibility	1.9
Metrics	2.0
New Products/ innovation	2.1
Global competition	2.2

Note:
1 = Very important

These findings raised two basic questions, and resulted in our conducting a follow up survey shortly after the results of the first study were completed. Those two questions were:

- How integrated are today's systems / software packages?
- How many different logistics packages are people using today?

Understanding the number of different software packages that companies are using in each area was not as straightforward as it first appeared. Respondents were asked to identify the number of packages used in the area, and the number they expected to be using in three years. In some cases companies were planning on adding an application that they do not currently have.



One way to increase visibility is to make it easier to transfer information within the organization. Going to a standard IT platform means that everyone has access to the same data, using the same set of definitions. More firms are seeking ways to standardize the IT platform across the globe. In addition, we found several firms that were adding capabilities or IT products that they currently did not have. This is especially the case with RFID. We believe that firms reducing the number of applications as well as adding the capability will both have a positive impact on overall supply chain visibility.

Exhibit 9

		Different Software packages		
Supply Chain Visibility	Factor	Decreasing Number of Applications	Adding Capability	Total
	ERP	66.7%	8.3%	75.0%
	RFID	16.7%	50.0%	66.7%
	Order Fulfillment	50.0%	8.3%	58.3%
	Strategic planning)	28.6%	28.6%	57.1%
	Mobile/statellite communications	28.6%	28.6%	57.1%
	Demand/pricing/revenue	45.5%	9.1%	54.5%
	TMS	33.3%	16.7%	50.0%
	WMS	30.0%	20.0%	50.0%
	point of sales data	25.0%	25.0%	50.0%
	Network planning	25.0%	25.0%	50.0%
	Global logistics software	0.0%	50.0%	50.0%

The remaining question is to understand how well integrated each of these applications are with each other. Findings from 2001 are also presented below.

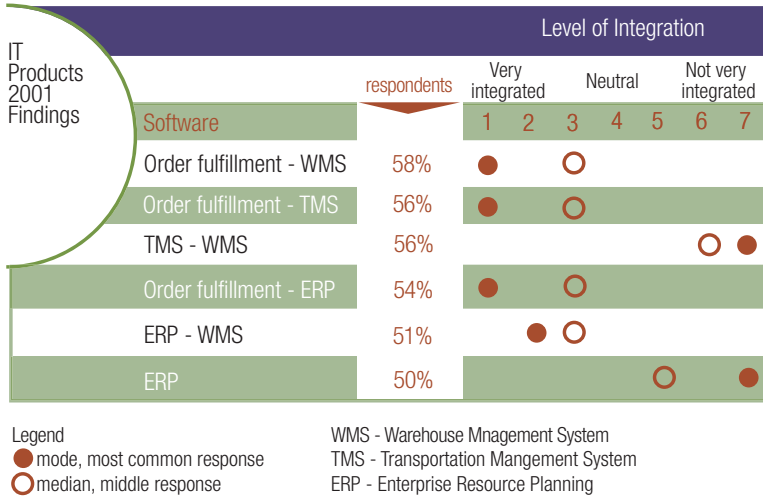
Exhibit 10

		Level of Integration						
IT Products 2004 Findings	Software	Very integrated		Neutral			Not very integrated	
		1	2	3	4	5	6	7
	Order fulfillment - ERP	●		○				
	Order fulfillment - TMS			●	○			
	Order fulfillment - WMS		●		○			
	TMS - WMS				●	○		

Legend
 ● mode, most common response
 ○ median, middle response

Historically, order management has to be integrated well with the ERP systems. As noted above, there has been a consolidation of the ERP systems and integration remains high. This consolidation and use of standardized interfaces has enabled an improvement in the integration of decision support systems such as TMS and WMS both to the ERP and to each other.

Exhibit 11



What is interesting with the findings - especially compared to the data from 2001 - is the seemingly lack of improvement in the eyes of the logistics professional. What enterprises believe they are achieving may be masked by internal IT hype or misleading advice from point solution vendors.

Challenges in Definitions

Logistics seems to be an antiquated term destined for history books. Business cards, articles, press releases and webinars use the words “supply chain” where they once wrote “logistics.” It’s as if the profession has done a huge “find and replace” on the two terms.

One only has to look at the recent name change announced by the Council of Logistics Management to verify this trend. CLM will officially be known as the Council of Supply Chain Management Professionals (CSCMP) starting in January, 2005. CSCMP will broaden its focus from logistics to explore the wider range of issues surrounding the supply chain. In our haste to color all things “supply chain,” have we have lost the distinction that the two terms provided?

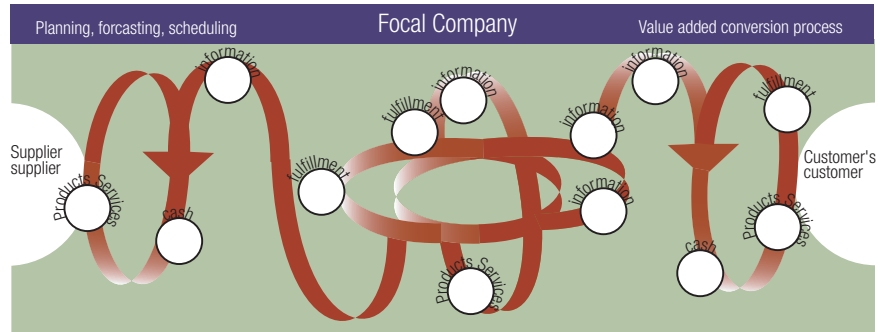
We believe that there are significant and important differences between these two terms. For purposes of this report, a supply chain consists of “three or more organizations directly linked by one or more of the upstream and downstream flows

Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customers’ requirements.

Council of Logistics Management, 1998

of products, services, finances, and information from a source to a customer." One of the most critical parts of this definition is that this chain consists of multiple partners; it is by nature boundary spanning. Logistics consists of the activities that occur within the boundaries of each of the individual firms. A representation of a simple supply chain can be found below.

Exhibit 12





In contrast, logistics is part of the supply chain. It is an important part, but a part none the less. It is the linking of logistical activities across multiple firms (three or more) that make up a supply chain. True supply chain efficiencies will only be obtained when we learn to fully link and manage these activities across company boundaries. To do so will take a significant level of trust.

It is interesting to note that an increasing number of practitioners in the profession typically refer to themselves as supply chain managers. Thus we see, from military positions to voluntary organizations, a continued demand for professionals in this field in order to produce the efficiencies indicated by our respondents.

The Visible Supply Chain

Firms will compete supply chain to supply chain.

As with many things in life, this is easier said than done. From a practical sense, what does this mean? How will it be achieved? What are the metrics for success? One of the ways to answer these questions is to look at three of the most basic flows in the supply chain: information, products and services and finances.

Information flows will have to be seamless if the visible supply chain is to be obtained. This means that the demand signal must be shared with all of the participating partners. For instance, if the end consumer purchases 100 units, that unfiltered, unaltered information has to make its way all of the way back to the final partner in the supply chain. If there is an interruption, the actionable information must reach BOTH the customer and the agent responsible to make adaptations in order to fulfill the order on time and in full.

In addition to sharing true demand, all relevant parties in the supply chain need to better understand what promotions will be offered to the consumer. These offers should impact inventory levels. Instead of building components farther up stream in anticipation of demand - knowing that sooner or later there will be a promotion on the product - this demand should be shared to allow partners to better plan how they will meet that need.

Second, information regarding inventory levels, such as WIP and finished goods, should be transparent to the channel. This is increasingly important for those firms utilizing a postponement strategy. The farther upstream the data is shared, the more efficient the supply chain can become.

The Visible Supply Chain

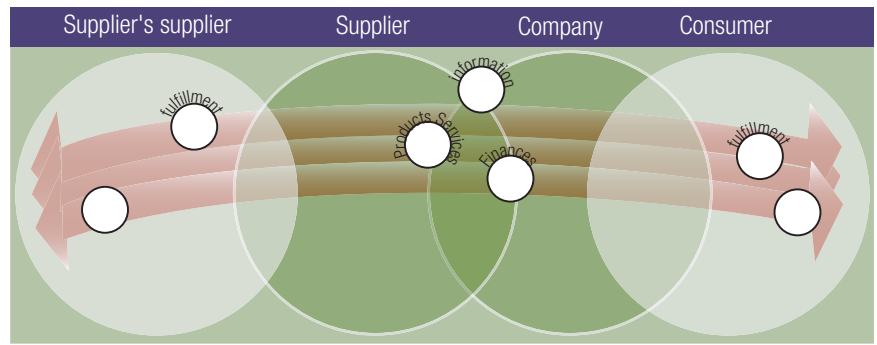
- Clean and clear demand signal that is shared with all parties
- Reduction or elimination of inventory based on risk
- Shared benefits for improvements
- True flow of information, products, services and related information

Many companies are missing the opportunity to use Sarbanes-Oxley compliance as a way to drive toward world-class performance, reducing costs and improving both efficiency and effectiveness.

The Hackett Group
August 2004

This is not to suggest that all components are equal. Attention should be placed on non-generic parts, which can be defined as those parts that are specific to a product or product category.

Exhibit 13



Finally, the supply chain must take into account how its total operations will be financed. Financial institutions would compete for the supply chains' financial needs, and not each individual partner. In theory, this should reduce the risk to the financial institution, by pooling risk.

The Global Supply Chain

The complexity of "competing supply chain to supply chain" gets more complicated as procuring raw materials and providing finished goods on a global scale is considered. The variability in currency, tax rates and fees around the globe has pointed to a new use for data from the visibility function; adaptation of the supply chain to take advantage of low wage and low tax resources anywhere around the globe. The exodus of higher-paying technical jobs from North America and Europe are evidence of this adaptability. Even the Maquiladora operations in Mexico have lost over 330,000 to Asia since President Fox took office.

The implication is that logisticians must have skills to provide actionable information to top management so that an informed decision regarding the global supply chain can be made. Too often important costs, operating constraints and customer service implications go unnoticed until after the supply chain has been re-configured.

Understanding the Metrics

Actionable information assumes the metrics are standardized and well understood by all parts of the supply chain. If firms are going to develop a supply chain vision, true supply chain metrics must be developed and utilized. That is, they must measure processes across multiple firms. To just say a metric is a supply chain measure does not make it so.

The language of actionable information is metrics.

There are several prerequisites before this can occur. First, metrics have to be defined. While this may sound simplistic, multiple definitions for common metrics usually exist between partners. This generates significant misunderstandings. Second, the metrics must be truly boundary spanning. For instance, instead of measuring turns for one supply chain partner - a logistics metric - turns would be measured for the supply chain. Instead of the supply chain parties attempting to optimize their own turns, all would work together to determine ways to increase turns - and thereby reduce the total landed cost to the end consumer.

There are two key potential supply chain metrics - metrics that can be boundary spanning. They are total order cycle time and cash to cash. While these metrics have typically been applied at the logistics level, they can be applied at the supply chain level. This will require that the base definition of each be expanded to include multiple firms, and not just a single organization.

How Much Visibility?

In this year's study respondents were asked to describe the level of visibility they had in their domestic and international supply chains. For purposes of the study, the supply chain consisted of the customer, inbound and outbound transportation, the respondent's firm, its supplier and supplier's supplier. Visibility into a series of areas for each was collected and is presented below. When the component of the supply chain consisted of several attributes, the average of the combined factors is shown.

As the exhibit following suggests, the greatest amount of visibility that has been achieved in the domestic supply chain revolves around outbound transportation. These results should not be a surprise, given the level of energy expended over the past two decades in monitoring and tracking outbound shipments. What is interesting is how quickly visibility is lost as one moves farther away from the respondent's frame of reference. If firms are to truly compete "supply chain to supply chain," greater visibility, coordination and planning will have to exist between each of the supply chain partners.

It is noted that the responses imply that the "visibility" is likely in the form of carrier EDI or web page messages. This has been the platform for outbound visibility for some time. These messages require inspection and interpretation by a skilled

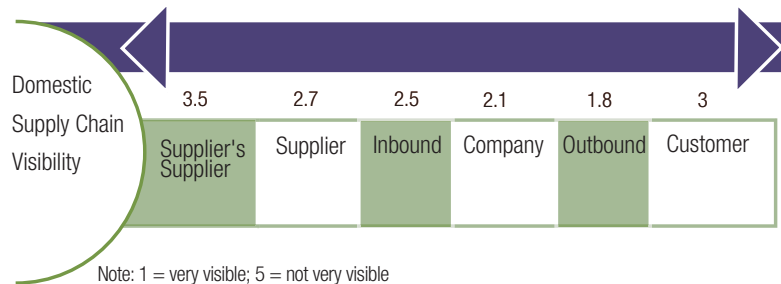
Total Order Cycle Time - from the time non-generic parts / components are ordered until the final product is received by the ultimate consumer or the final partner in the supply chain. Non-generic parts are defined as being specific to the product or product category.

Cash to Cash - from the time non-generic parts / components are paid for by the first party in the supply chain until the final product is paid for by the ultimate consumer or final partner in the supply chain.

logistics operations person. However, what will happen if the same amount of data were available from the entire supply chain? Or, compound that problem by considering all of the information provided by RFID. It is hard to understand how anyone could handle that much raw data manually.

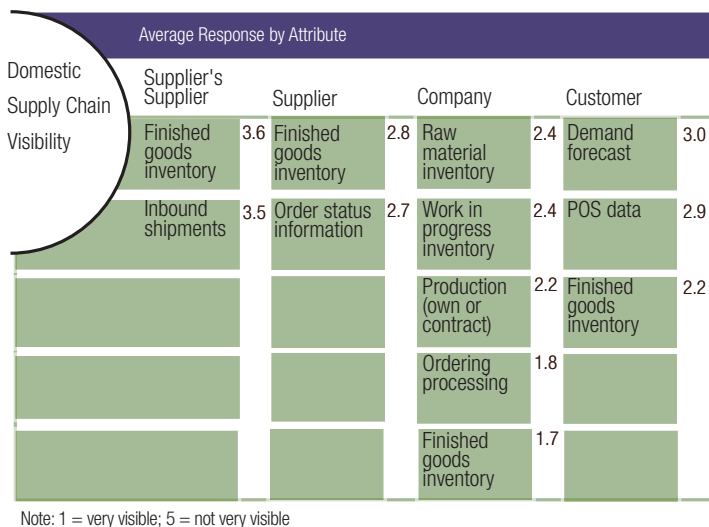
Is there a misinterpretation of visibility by the respondents? When considering visibility it is important to consider-"how are we measuring it?" Running a trace on a parcel is one method. Receiving an ASN from a supplier is another. True visibility comes from an aggregate analysis of all inbound and outbound materials on a daily if not hourly basis. Has the enterprise reduced overall safety stock due to confidence in the supplier base? Have service levels increased from better logistics execution and carrier reliability stemming from more predictable lead times? The respondent data suggests a narrow definition of visibility. Better communication within the four walls and with important customers should not be confused with integrated supply chain visibility.

Exhibit 14



What is of interest is the higher rating given to internal visibility, which can be more difficult to achieve. Clearly, as firms continue to implement integrated software solutions, some of the technical obstacles surrounding internal integration will be minimized. However, it will continue to take management skill and vision to tackle the organizational challenges of molding the culture to accept and thrive on change and to be able to process vast amounts of external data.

Exhibit 15



The research team next explored those firms that reported higher levels of visibility at the domestic level to those that did not. Respondents were placed into three categories (high, medium and low visibility) based on the aggregate responses to the fourteen variables. High visibility firms were compared to low visibility firms to determine what, if any, differences could be found.

Demographically, several key differences - and similarities - were found between the respondents based on their level of domestic visibility. These are noted in the exhibit below.

Exhibit 16

Differences found based on reported levels				
Domestic Supply Chain Visibility	Factor	High visibility firms	Medium visibility firms	Low visibility firms
	Strategy	Customer service	Mix: be all things to all people	Product/Market innovation
	Primary objective of the division	Increased customer satisfaction	Reduce costs	Maximize profitability
	Integration of transportation and distribution	Very integrated	Integrated	Integrated
	Annual sales greater than 9 billion (% of respondents in this category)	18.8%	6.1%	7.8%
	Type of firm/industry	No differences found		
	Location in the supply chain	No differences found		

It has been theorized that the greater the size of the firm, the more resources that they would have available to develop superior visibility. Our results suggest that of those firms with sales greater than \$9 billion USD per annum were more likely to rate themselves as having high domestic visibility. Given the traditional methods for processing tracking data this suggests that there may be a correlation between capability for visibility and the number of people required to process the data. A subject for further study will consider FTE (Full Time Equivalents) and the level of visibility reported by the company.

It is heartening to note that other demographic information, such as the type of firm / industry and location in the supply chain did not impact the respondent's perceived level of visibility. And, while size of firm did have some statistical impact, less than 20% of the companies with sales over \$9 billion USD viewed themselves as having achieved a high level of domestic visibility.

What strategic differences can be found between these groups? High visibility firms are focused on the customer. Intuitively, this makes sense as customers

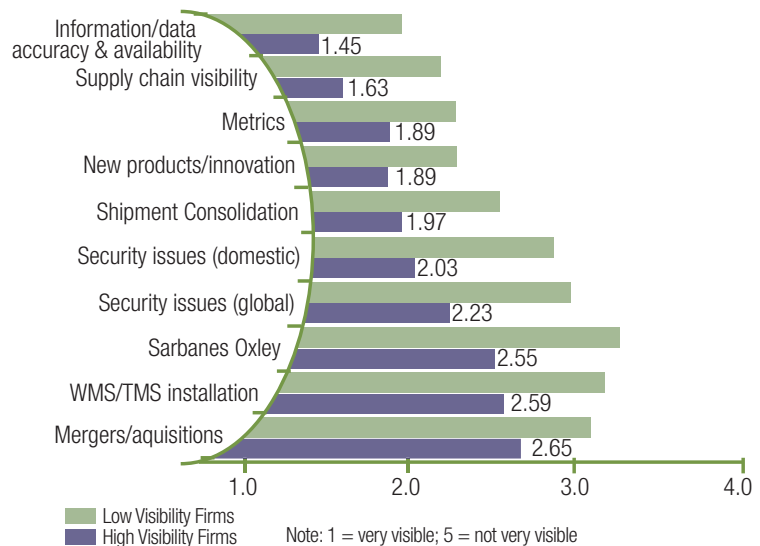
expect more from their supply chain partners. This is contrasted with those firms that are more focused on product innovation as a strategy. Here, the product is the draw / reason to partner with the firm. Domestic visibility might be nice, but it is not a necessary component in the firms' strategy.

Respondents were asked to rate several areas as to how important or influential they would be on what they worked on this coming year. Of the twelve attributes, ten were highly significant; in these instances high visibility firms ranked these as being more important than low visibility firms.

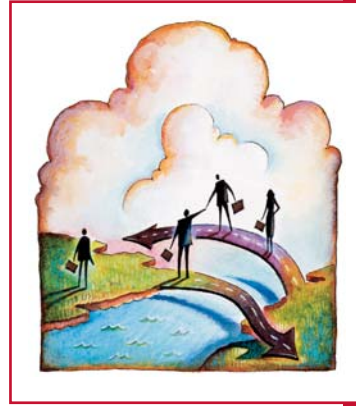
The level of domestic visibility also differentiated what the respondents saw as influencing their work and activities this coming year. High visibility firms saw each of the variables as being much more important and influential than low visibility firms. This suggests that as we start to gain visibility and actionable information that the value of having it is realized and a new round of connections is sought as well as a new push for real-time information.

The annual responses have indicated a growing importance in visibility. The demographics suggest that larger firms are starting to get it and put resources behind data collection and synchronization. As indicated in Exhibit 17 below, the small firms rank the same items as important but not yet as important.

Exhibit 17



What didn't make the list? Global competition and an ERP installation. It appears that these firms all recognized the shrinking world around us, and the level of trade that continues to grow. Finally, it appears that high visibility firms are more likely to have implemented an ERP system compared to low visibility firms, given the lower importance placed on it.



Finally, are there tangible benefits that can be derived from having greater visibility into the supply chain? After all, shouldn't there be some tangible benefit derived from putting these tools in place?

One area that visibility should impact the supply chain the most revolve around inventory management. As domestic visibility increases there is less of a need for inventory to cover uncertainty in the process. Specifically, inventory turns, DSI and DSO should be lower for those firms reporting higher levels of supply chain visibility. Statistically significant findings were found in these three areas. This provides tangible proof that visibility can - and has - impacted supply chain performance.

Exhibit 18

Benefits of Greater Domestic Visibility			
Domestic Supply Chain Visibility	Factor	High visibility firms	Low visibility firms
	Number of turns (finished goods only)	14.6	9.8
	Days sales in inventory (finished goods only)	22.1	38.2
	Average days sales outstanding (accounts receivable)	26.1	39.4

Summary

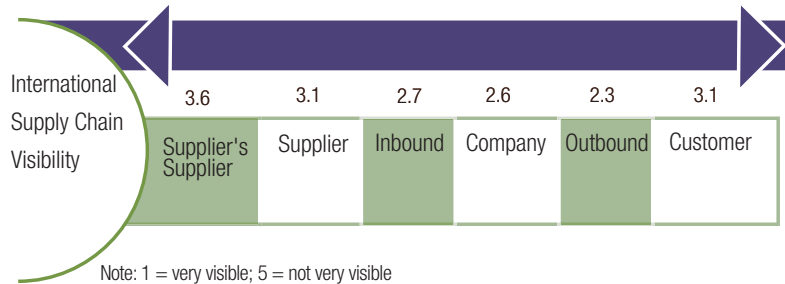
Firms reporting a high level of domestic supply chain visibility experienced better inventory performance than those that reported lower levels of visibility. It is a well known axiom that we use inventory when there is uncertainty in the process. Certainty comes from a verifiable sensing that the supply chain is in good order and performing to the metrics promised.

This is not to suggest that there is no room for improvement. On the contrary, this should begin to highlight what benefits can be derived by achieving only modest levels of visibility. How much better would the companies be performing if they had truly integrated, visible supply chains?

State of International Supply Chains

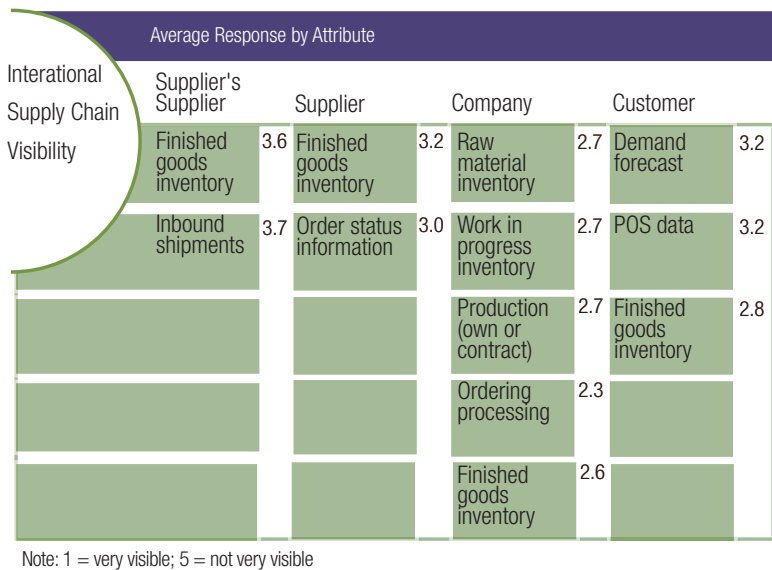
The same analysis was also conducted regarding the state of visibility for international supply chains. Again, greater visibility should result in better overall performance in key logistics metrics.

Exhibit 19



As the above exhibit indicates, the average response as to the level of visibility appears to be similar to that of domestic visibility, with overall lower levels of visibility. This similar average would appear to be welcome news for those that have struggled to increase visibility over an extended supply chain.

Exhibit 20



However, averages tend to wash out some of the significant differences between domestic and international visibility. Means are impacted by extreme responses, while the median represents the mid-point in the data. When the median is used, these extreme responses have less of an effect on the data.

Where are the differences most significant? Interestingly, at the international level internal integration is not as great as domestic integration. Of the five attributes in "For your firm," five had a higher (less favorable) median. This tends to confirm the difficulty in "getting one's house in order" for the global supply chain.

Exhibit 21

Median Comparisons for Domestic & International Visibility Ratings			
Domestic & International Supply Chain Visibility	Area	Domestic visibility median	International visibility median
	For your average customer:		
	Finished goods inventory	2	3
	POS data	3	3
	Demand forecast	3	3
	For your firm:		
	Order processing	2	2
	Finished goods inventory	1	2
	Work in progress inventory	2	3
	Raw material inventory	2	3
	Inbound shipments	2	3
	Outbound shipments	2	2
	Production (own or contract)	2	3
	For your average suppliers:		
	Inbound shipments	3	3
	Finished goods inventory	3	3
	Order status information	3	3
	For your supplier's supplier		
	Inbound shipments	3	3
	Finished goods inventory	3	3

Note: 1 = very visible; 5 = not very visible

The data suggests that there is room for improvement. It also suggests that the race is on. If a smaller company wants to grow in a competitive channel, some way must be found to provide visibility internally and externally, presumably without adding more staff.

Our Collective Point of View

Vision: the supply chain

Despite the current trends that have dominated the popular press in recent years, a strong and clear distinction is needed to differentiate between logistics and supply chain management. It is not a cosmetic change, like a new business card, but a new frame of reference. Logistics is an important part of the supply chain; Logisticians are the managers of the supply chain's operational links.

Management of a supply chain is technically possible. Integrated technological solutions are available to link firms together in a clear and seamless manner. The number of firms currently managing their total supply chain is few, but the interest



Information must be:

**Real time
Accurate
Actionable**

in doing so is increasing. Visibility to inbound materials and products (example the RFID push) is indicative of the trend. To be successful, partners will have to be willing to change what they are doing, develop a significant level of trust and to work collaboratively on metrics, communication and data synchronization.

Visibility: the quest continues

The quest for visibility in the supply chain continues. While inroads have been made, much is left to be done. Work in this area will have to be done quickly, as global trade expands, technology enables (and drives) greater expectations from our customers, and security issues remain unabated. Due to the increasing complexity and globalization of supply chains, visibility is not enough. The assistance of supply chain event management (SCEM) tools and the synchronization of data are becoming critical to achieve productivity goals.

Interestingly, the greatest level of visibility for both the domestic and international supply chain is on outbound transportation. This same pattern is repeated for internal company visibility and inbound freight. As one moves farther away from transportation, visibility begins to drop off. Clearly, the connected supply chain is wanting; visibility is even less for the international supply chain.

Several popular initiatives will either make the quest for visibility attainable or unreachable. The one that has received the most attention is of course RFID. The power behind this new solution is not just the visibility it should provide customers or suppliers, but the visibility it should provide everyone in the supply chain **at the item level.**

The data that RFID can provide is awesome but integrating that data into Supply Chain Event Management is a big challenge. Plus, there is a risk to enterprises worth mentioning-digital waste. RFID promises to bring ten times as much inventory information into supply chain planning models. Deciphering just which data is relevant may become cumbersome to the point that it paralyzes decision making. It is only after the data integration and synchronization that actionable information is available.

Integration of supply chain solutions is what provides value, not the solution itself

Technological capabilities are no longer a barrier to increased visibility and performance. Companies are not constrained by the technology as much as they are limited by the skills of the people that will be using the technology.

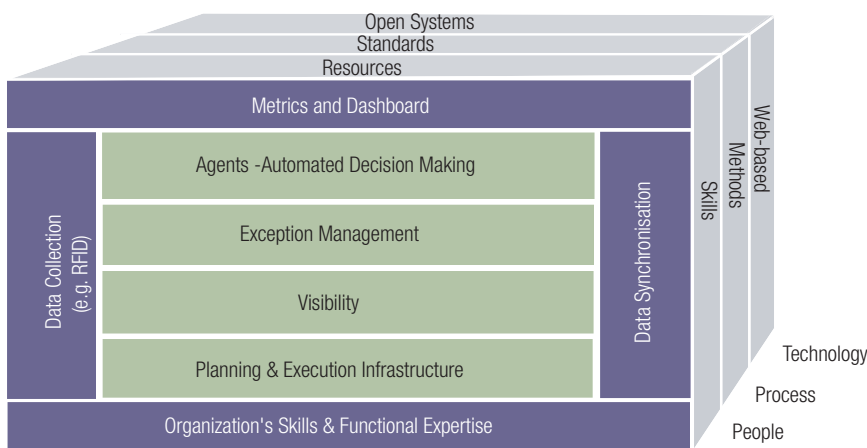
Yet, to truly deliver the value that these packages provides they must be integrated and synchronized to provide real time information. Information that is provided at the end of the week doesn't provide the visibility needed to act on Tuesday. Disconnected technology leads to dysfunctional decisions.

Integration is even more critical if firms work together to manage - with their partners - the supply chain. For instance, should our down stream or upstream partners see or know how long it takes to pick their order, its status, or what steps they will have to take in order to get it delivered in time?

How integrated should the supply chain be? Again, operating on the assumption that firms will compete “supply chain to supply chain” then both internal and external connectivity and visibility is a necessary foundation.

Cappgemini has proposed a model for linking the traditional functional areas of the supply chain to the higher levels of visibility and further, the emerging use of agent technologies to take action for us when presented with actionable information.

Exhibit 22



Functions/Operations: The unique work done at the departmental level by experienced professionals to support emergency response, customer service, maintenance and construction. Also referred to as the Plan-Buy-Make-Move>Returns phases of operations.

Decision Support: The tools utilized to provide speed, optimization and connectivity with suppliers and improved customer service (UMS, TMS, OMS, LMS, etc.).

Visibility: A transparency made possible by web-enabled data gathering of sourcing, movement and inventory data at the order and item level.

Supply Chain Event Management (SCEM): The process and technology that connects the individual execution plan for handling and delivery to the data provided by the visibility function. The ability to program notifications and alerts in the form of actionable information.

Agents; Automated Response: Just emerging are software programs and software enabled processes that quickly select new solutions and take corrective actions in order to ensure customer service needs are met decisions are taken in a timely manner.

Data Collection: The process and technology for collecting the need information (RFID is but one of these).

Data Synchronization: Global data Synchronization (GDS) enables the data from disparate systems to be leveraged to produce actionable information.

Metrics and Reporting: Metrics are the common language of collaboration between supplier and customer. Standards and web-based transparency are critical to a successful logistics and fulfillment strategy.

People, Process and Technology are the elements that enable the adaptive, collaborative supply chain.

The language of actionable information is metrics

Good management starts with a strategy; management knows where they are headed. And, they know when things are not going right. Management is increasingly focused on competing through Supply Chain Capabilities. Thus management is seeking a “dashboard” of KPI’s that allows them to act. Management is seeking a language to communicate with customers about the effectiveness of their more competitive capabilities.

This sense of knowing for logistics should be based on commonly defined and agreed upon metrics. They must be understood by all parties. They must be transparent. They are the objective tools that aid us in achieving our strategy.

For a supply chain to be successful, metrics must be customer focused. Metrics must be customer driven. They must measure what is critical to the customer. In today’s competitive environment, metrics should measure two key ingredients: time and cost. For this reason, we propose that supply chains, as well as individual firms, work at an integrated cash to cash metric and a total order cycle time metric. At the firm level, a third metric should also be employed: the perfect order.

Upon reflection, how would an integrated supply chain, using common metrics, operate? How would inventory levels be changed or modified? Where would inventory be held? How would the inventory in the supply chain be financed?

This is not a radical idea. For instance, a firm we are familiar with has a VMI program with a major retailer; the supplier has access to POS data and inventory levels at the retailer’s DCs. In addition, the supplier can see what they have in stock, what is committed to the customer, as well as the production that can be committed to meet the needs of the customer. This information can then be used

to better manage the delivery of raw materials into the manufacturing process - actionable information.

What are the benefits? Better availability of goods on the shelf. Better fill rates for the retailer. Better turns for the supplier. This should translate into greater value to the customer; it is effectively competing supply chain to supply chain.

What It Means to Us

Oracle Corporation - Software Provider

Oracle supports the vision of fully integrated logistics execution. As customer's needs have evolved so too has ERP providers need to provide suites of SCM applications. Technology must support best practice processes. Therefore, when customers manage flow of products and services from raw materials through production and ultimate delivery-their ability to execute flawlessly is only as strong as the ability to manage information across the supply chain.

Oracle supply chain customers have steadily migrated from a matrix of different solutions (e.g. point solution vendors) to one integrated suite. The advantages are clear in the logistics execution area. Trading partners push inbound material information through portals. Customers forward demand information directly into supply chain planning modules. A logistics manager can now optimize distribution not from monthly or quarterly forecasts, but rather from hourly planning data that extends throughout their supply chain.

The next challenge for best practice logistics applications is to harness the value of latest best practice processes emerging globally. This includes integrated Sales and Operations Planning (S&OP), Demand-Driven Supply Networks (DDSN) and RFID. The quest for event-driven supply chain management continues at a furious pace. Enterprises who invest in applications infrastructure have the best chance to lead their industries.

Academic Perspective

One of the biggest challenges facing logistics and supply chain educators is keeping up with the transformation of the discipline. How do you teach the basics of logistics, transportation and supply chain management, and at the same time prepare them with the tools they will need to enter the work force? Recruiters are looking for aggressive students that have the skills and confidence to make an impact on the organization quickly.

Clearly, we cannot do this alone. While we can provide the basics for our undergraduate students, we must partner with companies to ensure that students can learn through extended internships or co-ops. By blending practical hands-on experiences with the theoretical underpinning, students can make better decisions for their employer.

This also means that faculty will have to venture from their campuses and visit and work with practitioners to gain a better understanding of the changing environment. We as a discipline are fortunate that we have had role models who have done so in the past; as a result, we are not as isolated from “the real world.” Yet, perhaps, even more needs to be done: sabbaticals or faculty internships are now being explored as a way to bridge the gap.

Capgemini Perspective

We continue to be impressed with the speed of change in the Logistics and Fulfillment market. The survey respondents, and our clients, express the need for “visibility” as critical. The primary reasons, as reflected in this year’s responses, are first, an extended supply chain that demands extending data collection globally in inbound and outbound movements and second, the increasing role that regulations and customer requirements play in the re-design of the technology and process of order fulfillment. Just getting it there is not sufficient. We must demonstrate an infrastructure and information handling capability that is transparent to the customer as they justifiably ask: “Where is my order?” Third, data synchronization, the alignment of data bits as well as operational processes. The metrics that demonstrate this are critical to success, particularly as firms get larger and more global in scope. Lastly, new use of technologies such as RFID , agent -based decision support and data warehousing are changing the collaboration needed between supply chain partners. A new process of reviewing the hand-off points and each other’s metrics is becoming an exchange of equals rather than just another buyer-to-vender obligation. Global Data Synchronization (GDS) is emerging as a supply chain driven IT imperative. This survey provides actionable information to Logistics professionals. It calls for new horizons in Supply Chain Management as a profession. Those not in the position of driving change in their organization, will find themselves marginalized in every sense of the word.

The Authors

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Mr. Abbott has over fifteen years of experience in supply chain management from industry operations, management consulting, and software/technology sales. For the past four years Mr. Abbott has lead the national Supply Chain Management sales team for Oracle Corporation. This team of functional experts serves as primary sales force for Oracle’s supply chain suite of applications. This includes-sourcing, procurement, planning, manufacturing, maintenance, and logistics. Prior to joining Oracle Corporation, Mr. Abbott spent six years with Accenture in the Supply Chain Strategy Practice.

Mr. Abbott also has five years of operations experience with Saturn Corporation, International Paper, and Georgia-Pacific Corporation primarily in planning, distribution, and logistics roles.

Mr. Abbott holds a BS in Logistics and Transportation from The University of Tennessee and an MBA from Georgia State University.

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Dr. Manrodt is an Associate Professor in the Department of Management, Marketing & Logistics at Georgia Southern University. An active member in CLM, he is serving as the 2004 Annual Conference Chair. Research interests revolve around the role of information in logistics systems, performance measurement, the role of logistics in health care, and customer value determination in a logistics setting. His publications have appeared in such journals as the Journal of Business Logistics, DC Velocity, Supply Chain Management Review, Transportation Journal, the International Journal of Physical Distribution and Materials Management and Interfaces. His research on top shippers has appeared in Logistics Management for the last thirteen years. Dr. Manrodt has recently co-authored a second book, *Keeping Score: Measuring the Business Value of Logistics in the Supply Chain* for the Council of Logistics Management.

Peter Moore

Peter Moore is a Vice President in the global Supply Chain practice of Capgemini. Mr. Moore leads the Logistics & Fulfillment as well as the RFID practices in North America. Mr. Moore has over 30 years of experience in manufacturing, third party logistics services and consulting. With deep operational knowledge in all aspects of Supply Chain, Peter has provided strategic and tactical leadership and consulting to general manufacturing, eCommerce, agricultural, consumer, and retail, pharmaceutical and chemical firms both in North America and in Europe.

About the Participants: Oracle, Georgia Southern University, Capgemini and The University of Tennessee

Oracle Corporation

Oracle is the world's largest enterprise software company. We provide innovative software that helps our customers manage and grow their businesses and operations. Our products include an integrated suite of business applications software and other business software infrastructure, including application server, collaborative software, and development tools. We also offer extensive services such as technology and applications hosting, consulting, support, and education.

Our goal is to provide our customers with scalable, reliable, and secure database technology software and integrated business applications software that give them transactional efficiency and quality information-at a low total cost of ownership.

Oracle's Supply Chain Management (SCM) Suite is among the most comprehensive offered. Our SCM Suite includes-sourcing, procurement, manufacturing, advanced planning, warehouse management, mobile supply chain applications, transportation, product lifecycle management, and enterprise asset management to name a few.

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<http://www.oracle.com/applications/scm>

Capgemini U.S. LLC

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Capgemini's Supply Chain Management Service Line is a recognized global leader in supply chain consulting, offering a range of services from supply chain strategy and architecture development, to business and technology integration, to full-service process and technology outsourcing. In addition, Capgemini has developed new offerings to address the current market's customer-centric business challenges and to help companies build dynamic, adaptive supply chains.

For further information, please visit www.capgemini.com.

Georgia Southern University

Georgia Southern University is a growing nationally recognized logistics program located in Statesboro, Georgia. The university is a major teaching and research institution. The faculty publish in a wide range of topics and are invited to speak at events across the globe. The Southern Center for Intermodal Transportation offers a wide range of research services and resides in the College of Business.

For further information, please visit www.GeorgiaSouthern.edu.

The University of Tennessee

The internationally recognized logistics program at The University of Tennessee, Knoxville, is one of the most comprehensive and contemporary programs in the nation. The faculty publishes widely on topics of current industry concern and explores future trends through research and studies.

For further information, please visit www.utk.edu.

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