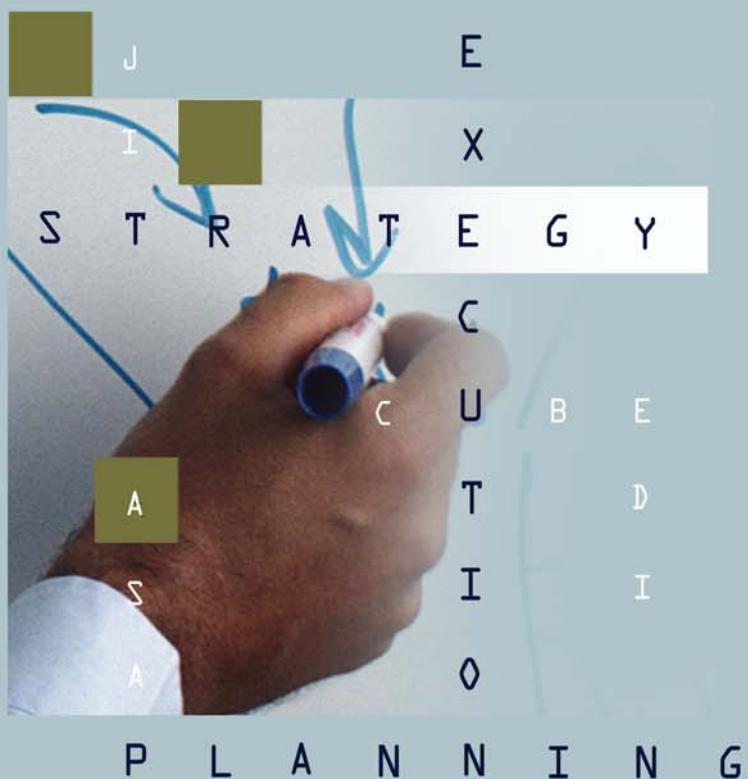


15th Annual Report

Year 2006 Report on Trends and Issues in Logistics and Transportation



The Power of O³

Optimized Strategy, Planning, and Execution



The Power of O³: Optimized Strategy, Planning, and Execution:

Year 2006 Report on Trends and Issues in Logistics and Transportation

Table of Contents

Introduction	1
Demand Driven Supply Chains: The Power of O ³ - Optimized Strategy, Planning and Execution	2
Six Drivers of World Class Excellence	4
The Power of O ³	6
Optimized Strategy	7
Optimized Planning	12
Optimized Execution	18
The Power of O ³ : Assessing the Gap Between Supply Chain Leaders and Followers	22
Our Collective Point of View	25
Looking Forward	26
The Authors	27
About The Companies	28
Contacts	30

Introduction

Capgemini, Georgia Southern University, and the University of Tennessee, in partnership with Oracle and Intel, are pleased to present this report drawing from the results of our 2006 research on trends and issues on supply chain, logistics, and transportation. This report marks our 15th annual examination of the topics that challenge managers on an on-going basis in the conduct of their business. This report builds on a six-year effort to review the major drivers of supply chain excellence.

As early as 2000, we were advocating the value of transforming the organization to a more adaptive, flexible entity. Never has the need been greater than in 2006 as the global supply chain pressures have created a set of business drivers and competitive requirements that severely stretch the logistics and supply chain operations capabilities of most enterprises. The challenges currently facing logistics, transportation, and supply chain managers such as fuel surcharges, lack of transportation capacity, increased variability in order-cash cycles, and on-time deliveries that declined for every mode in 2006, are to a large extent out of their control. The findings of our 2006 study indicate that much work remains to be done to develop adaptive supply chains. The challenges require an examination of strategy and planning to optimize the firm's efforts. Execution alone won't accomplish the objective of maximizing effectiveness and efficiency in the supply chain. Optimizing strategy, planning and execution will enable firms to transform themselves from independent actors composed of independent parts and independent goals into collaborative parties in pursuit of a fully consumer demand driven supply chain.

Demand-driven supply chains don't operate under typical business rules. What's different is the speed at which customer (or consumer) requirements change; the flexibility of the supply chain to respond to environmental changes; the increased numbers of involved parties; product innovation and proliferation; and the rate at which knowledge is generated and disseminated across rapidly shrinking international boundaries and enterprise processes. A key to expanding and ultimately leveraging this flexibility is technology that enables order-cash process orchestration globally among sales, manufacturing, supply chain operations, and throughout a firm's trading partner community. How effective an enterprise manages, anticipates and responds to these market changes will be determined ultimately by its ability to keep the right products in the right quantity for the right customers.

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. It should be evaluated against the end-goal of an adaptive cross-enterprise supply chain; one whose efficiency is only matched by its effectiveness.

Sincerely,



Peter D. Moore
Vice President
Capgemini, Inc.



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



Mary C. Holcomb, Ph.D.
Associate Professor
University of Tennessee



Mike Riegler
Director
Oracle

This year's study offers an assessment of the state of optimal performance experienced by firms today, and points to areas for improvement.

Demand Driven Supply Chains: The Power of O³ - Optimized Strategy, Planning, and Execution

Our 2006 study, *Demand Driven Supply Chains: The Power of O³ - Optimized Strategy, Planning, and Execution*, details how each of these three components - individually and collectively - enable the firm to reach the next level in logistics and supply chain performance. The need for improved logistics performance from both an efficiency and effectiveness standpoint has never been greater. Most firms are dealing with a myriad of supply chain challenges such as increased transportation costs, capacity issues across multiple modes, driver shortages, and port congestion that has forced many to re-think their logistics network. In addition to examining current industry trends, this year's report presents implications for firms that are lagging in adopting leading-edge practice. Lastly, our research would not be complete without offering a way forward for those firms that aspire to become leaders in logistics and supply chain management.

Results of the study have been arranged in three major sections.

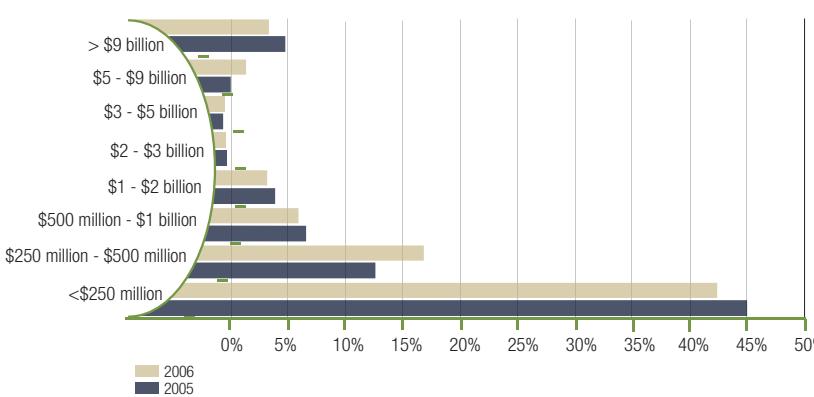
The first section, *Six Drivers of Supply Chain Excellence*, briefly examines six key capabilities that drive a transformation to greater efficiency in supply-chain, logistics and distribution processes. These

drivers – Collaboration, Optimization, Connectivity, Execution, Speed, and Visibility – are the benchmarks we used to evaluate the progress of our survey participants in achieving logistics and supply chain excellence. We have used these drivers to assess transformation progress over the last five years. Past years' studies have focused on visibility, execution, speed and collaboration. In 2004 two reports re-visited the barriers and enablers of visibility, and the role of connectivity in enabling visibility. In 2005 we tackled the important topic of collaboration, and identified key components to make it successful. The 2006 report exams the last driver - optimization. Optimal logistics and supply chain strategies require planning and execution that align individuals and organizations (both domestically and globally), standardize processes and practices, and enable the real-time sharing of data with key customers, suppliers and partners.

The second section of this report, *The Power of O³*, examines the three major areas that must be optimized in the supply chain: strategy, planning and execution. Each of these areas is discussed in detail, and contains the findings of our research. Each area includes a section called "What Should I Do?" that provides demographic information for each group.

Finally, we conclude with our collective *Point of View*, which highlights the authors' perspective on the results of the past year and offers recommendations for firms whose objective is to reach the next level of performance. These perspectives - industry, consulting and academic - provide a venue for

Figure 1 - Respondents years 2005 -2006



the authors to integrate their considerable experience with the key findings of the study. The Point of View suggests future direction for achieving the desired end-state in logistics and supply chain excellence.

Participant Profile

This year 1,111 individuals participated in the survey. The continued large number of participants, compared to years passed, provides greater confidence in the results and continues to allow us to analyze several categorizations of the data, including leaders and laggards.

Aggregated as a profile group, over two thirds of the companies who responded have annual revenues under \$1 billion (70 percent), while those with annual sales of \$1-3 billion accounted for 12 percent of the sample. Those firms with sales greater than \$3 billion accounted for 18 percent. This is remarkably similar to results from last year. Approximately two thirds of the companies from last year had annual revenues under \$1 billion (69.4 percent); 12.5 percent had annual sales of \$1-3 billion. Those firms with sales greater than \$3 billion accounted for 18.1 percent in 2005.

The firms that participated in this year's study also command a great deal of attention in that they account for more than \$61 billion in annual spending on transportation. Collectively, they have a significant impact on current and future trends in logistics and supply chain management.

In terms of transportation costs as a percentage of sales, from 2004 to 2005, there was a significant increase in transportation spending as a percentage of sales. Firms that spent more than five percent of their revenues on transportation activities rose by 4.5 percentage points (or a 24% change) from 2004.

In 2006, however, transportation spending as a percent of sales didn't take such a large bite out of the revenue dollar. The percentage of firms that reported they spent greater than five percent of the sales dollar on transportation declined by 38 percent. Since the participant profile by size of firm was not significantly different from 2005 to 2006, these results are telling.

What happened from 2005 to 2006? While things such as fuel costs and driver turnover certainly haven't declined, firms have worked extremely hard to find every possible efficiency in transportation. While their efforts have certainly made an impact, there is much more that can be done.

In terms of industrial sectors, while all are represented in this study, manufacturers led in survey responses. They comprised 40.8 percent of the survey sample. This is a decrease compared to last years' results of approximately 48.1 percent. The largest individual descriptor was Manufacturing - General at 21.1 percent.

While things such as fuel costs and driver turnover certainly haven't declined, firms have worked extremely hard to find every possible efficiency in transportation.

Connectivity is essential for supply chains that are both tactically efficient and effective in meeting customer expectations, and adapting to unforeseen circumstances.

Six Drivers of World Class 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. The six drivers were a culmination of eight years of analyzing trends and issues in supply-chain, transportation and distribution activities. In 2000, most firms recognized the critical importance and potential value of building and implementing the capabilities that define the drivers of excellence. Yet very few of them had made meaningful progress in operationalizing these capabilities - within their enterprises - and particularly across their supply chains.

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? Given the state of the economy at this time, many firms were faced with declining resources to fund multiple initiatives in the logistics and supply chain area. In 2002, we responded with the need for supply chain managers to focus on visibility in their supply chain. Three drivers - execution, speed, and optimization - were the focus of the 2003 research.

In 2004 the research team revisited visibility and connectivity issues. Visibility can have profound strategic implications for the entire organization. It sustains, accelerates, or enables the other drivers. Seamlessly sharing real-time (or near real-time) information about products, customers, and order fulfillment requires connectivity. It is essential for supply chains that are both tactically efficient and effective in meeting customer expectations, and adapting to unforeseen circumstances.

These studies led to an examination of collaboration within the supply chain in 2005. Visibility is one of the core elements of collaboration; that visibility must be both internal to the firm, as well as external with customers, and suppliers.

But, collaboration and connectivity are not enough. Demand-driven supply chains don't operate under the same business rules. Speed to customer (or consumer) is critical. Product innovation and product proliferation are accelerating. The time between optimization, planning and execution continues



to shrink. The network design completed five years ago needs revisions, as new customers, suppliers or manufacturing nodes are added to the supply chain. Old designs lead to sub-optimal results. Firms are facing some of the biggest challenges yet in terms of transportation, logistics and supply chain. Their ability to make the "best" decisions across multiple functions and activities will determine their success in the long term. "Best" decisions occur when strategy, planning and execution are optimized. This is the driver being examined in our 2006 study.

A Look Forward

Fuel surcharges..... Capacity constraints..... Crumbling infrastructure..... Political unrest..... Terrorist attacks..... Driver shortage International markets

Remember the good old days? Trucks ran on time. Inventory was always available. Inventory was always at the right place, right time, and right condition. Customers told you in advance when there would be a spike in demand, and gave you enough of a lead time to respond to it efficiently. And the biggest problem was where you were going to go to lunch that day.

Well, maybe it never was that easy, and it never will be. Rapid continuous change in the international supply chain has added a new level of complexity that must be managed in real time. Perhaps the time has come where the descriptor "international" should no longer be placed in front of "supply chain" as so few are truly domestic in scope.

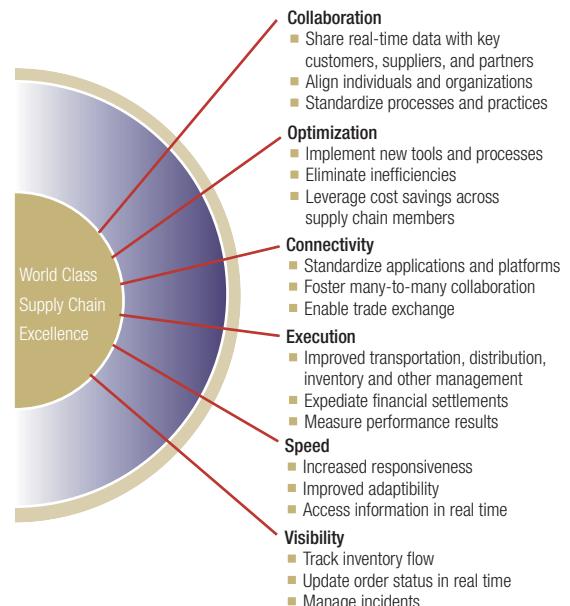
What is the world of supply chain management like? Today's managers face complex issues laid on top of strategic or infrastructural conditions that cannot easily be changed. Much like a Sudoku puzzle, supply chain solutions aren't a blank sheet of paper ready to be optimized, but rather have to be solved within the constraints of the puzzle. Clues are given in that some spaces are filled in. These provide both insight and constraints on the solution. Multiple parts must be solved for across, down, and within the puzzle. That is, they must be optimized as a whole. Today's supply chain professional

"Supply Chain Professionals are finding themselves presenting in the Board Room explaining how the enterprise will execute on global sourcing and distribution strategies of major firms. Analysts, Auditors and anxious customers want answers from business leaders to logistics-based challenges. It is no longer about smart procurement. It is about optimizing the network."

- Peter Moore, VP Logistics and Fulfillment/RFID, Capgemini.

must come up with an optimal solution based on the constraints of structure, strategy, product, customers, production capacity and locations, just to name a few. Just like Sudoku they have constraints in solving the supply chain puzzle, and direction (or clues) on how to find the solution.

Figure 2 - World Class Supply Chain Excellence



For the most part, the Sudoku solution appears to be easy to find. There are boundaries to the puzzle, and only one optimal solution. Just like most puzzles, however, you don't know if you are close until the solution is almost complete.

Of course, supply chains are much more difficult to complete than a simple Sudoku puzzle. Problems are easier to see on paper, and more easily bound. The range of solutions is limited; there is only one right answer. There is no "cost versus customer service" trade-off to consider. Supply chains often have a host of solution paths that can lead to a right answer.

More problematic, however, is the fact that supply chain managers work on a puzzle whose borders and contents are dynamic. A new company is purchased; a new supplier is added in New Delhi. A

new customer is located in Xi'an. An unprofitable division is sold. The elegant optimized solution of yesterday is now antiquated and costly today. Back to the drawing board.

Some may fret over this rapid change. We are flooded with information that seems to be gaining momentum and speed. Over forty percent of our respondents noted that demand forecasts are updated daily, or in real-time. Weekly updates are a thing of the past.

What does it all mean for logistics professionals today? Optimizing strategy, planning and execution is needed to:

- Secure the firm's long term profitability by removing the barriers to higher levels of supply chain efficiency and effectiveness;
- Create demand driven supply chains that are adaptive and flexible to produce greater customer value;
- Integrate diverse business units, both domestically and internationally, to achieve the necessary levels of visibility for true supply chain collaboration;
- Ensure the success of the supply chain in its competition with other supply chains by achieving results faster as global conditions change.

The Power of O³

Who gets it?

Who has put all the pieces of the puzzle together? Some aspire to be like Will Shortz, New York Times Crossword editor, or at least to have his ability to master and create puzzles. Juggling disparate pieces of a larger supply chain puzzle requires an overall strategy, a vision and prioritization of the immediate tasks, and the ability to execute the plan.

71.7% of high visibility firms have completed a supply chain network design project in the past three years.

Based on the research results, there are firms that do truly "get it." They understand their overall strategy, and have put in place the planning tools needed to move forward. In addition, they are executing on their plans using more real time / daily information than their peers.

For purpose of this report, supply chain leaders are defined as having several major attributes. First, they have completed a supply chain network design study within the past three years. Because the supply chain is a complex, dynamic network of facilities spread over a large geographical area, it is necessary to review that structure to determine if there is an optimal way to flow materials through that network. Supply chain leaders also have greater levels of visibility as compared to their peers. We live in the information age. The availability

of information / data on a real-time basis has broad implications for the effective design and management of an integrated supply chain. Last, but certainly not least, supply chain leaders manage and control logistics, transportation, and supply chain activities with a significantly more sophisticated set of tools and technology than their counterparts. The execution layer relies heavily on current data in order to make the best decisions possible. This need only increases the importance of having true global supply chain visibility. Each of these attributes will be discussed in more detail in the report.

Optimized Strategy

The strategic plan for most organizations is a result of considerable effort on the part of the company's executives, directors, and stakeholders in identifying the long-term goals of the organization. The strategic plan is essential to the long-term profitability of the firm. This is particularly true when the rate of change in the business environment is accelerating. The strategic plan requires management to consider a variety of scenarios that includes both challenges and opportunities. Without the strategic plan, management will spend a disproportionate amount of time reacting to "fires" rather than anticipating change and developing tactics to deal with it. The strategic plan must anticipate changes in the technological, competitive, legal, economic, political and even social environments to be comprehensive.

With the rising cost of logistics activities and the increased pressure to improve customer service, the "C" level has become increasingly aware of the need to include logistics and supply chain management in the strategic planning process. The challenges and opportunities for these two areas have never been greater.

Consider the case of a manufacturer that built their entire logistics network around shipments to a customer's distribution centers. How should the firm react if the customer wants the shipments sent directly to its retail stores and is not willing to pay any additional costs for this service? Is this a unique request, or the beginning of a trend for all retail customers? What will it mean relative to the manufacturer's strategic goals and objectives as a "value added supplier in the retail sector?"

The role of the logistics and supply chain strategic plan is to support the corporate or business unit level plan by moving the firm towards a logistics system that meets (or exceeds) customer requirements at the lowest landed total cost. By identifying the specific

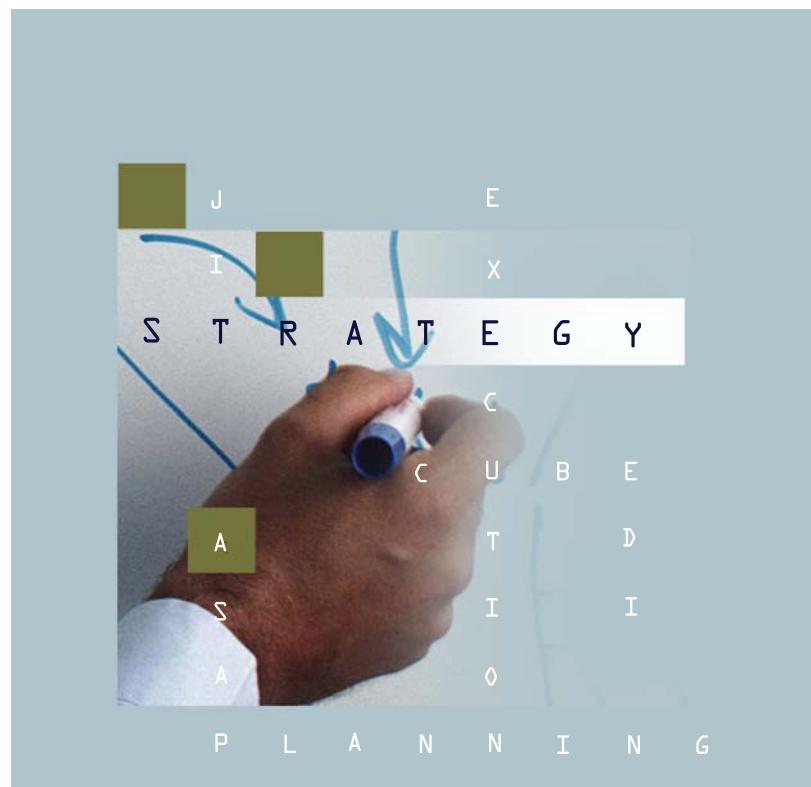
A Perfect Order =

On time

X Complete

X Damage free

X Correct invoice



requirements of customers, competitive service levels, changing environmental conditions, and the level of service the company desires to offer, the logistics strategic plan seeks to optimize the combination of resources that will efficiently and effectively meet the firm's goals and objectives

Strategy doesn't exist in a vacuum. Too often, there is a disconnect between the firm's strategic goals and objectives and that of the logistics function. A first step in developing a coherent strategy is asking what customers want, and then determining the means to deliver value to the customer. As more products or services are

added to the offer, customers begin to trade-off between what they want and what they can afford. We may want to drive a Bentley Continental GT, but based on cost and available resources drive a Toyota Camry.

So what do customers want? As Table 1 below illustrates, the list is long. Means are provided below; only those attributes with a median (mid point) response of "very important" are listed.

Perhaps one of the most striking findings from the table below is how it reflects the components of a perfect order index. A "perfect order" is considered to be on time, complete, damage free, and have a correct invoice. According to the findings below, orders aren't just to be delivered on time, but delivered on time and in full, or complete. Doing one without the other isn't going to cut it.

How does this manifest itself in the supply chain? A few observations may help.

First, we asked respondents which strategy best described their business unit. Interestingly, a large percentage chose a mix, that is, "be all things to all people." Interesting, this strategy has increased over 30% since 2003. At the same time, the focus on cost leadership has declined significantly, from nearly 23% in 2003 to 10.9% in 2006.

This is not to say that reducing costs are no longer important. While low or reasonable costs will always be desired, they are no longer a satisfier, but rather are expected. Just like the fusing of on-time deliveries and order fill rate to a single measure - on time

Table 1 - Service Attributes Important to Customers

Attribute	Mean
On time delivery	1.13
On time in full	1.19
Correct invoice	1.37
Available to promise	1.37
Responsiveness to changing requirements	1.46
Rush order capability	1.57
Ability to match PO's, invoices and BOLs	1.59
Over / short / damage	1.61
Order-to-delivery cycle time	1.68
Fill rate (order/line/SKU)	1.69

Note: 1=Very Important

Table 2 - Percentage of Respondents By Strategic Direction of the Firm

Strategy	2006	2005	2004	2003
Cost leadership	10.9%	12.6%	16.4%	22.9%
Customer service	34.2%	39.9%	35.9%	29.9%
Product / market innovation	14.4%	13.6%	17.1%	16.6%
Mix: Be all things to all people	40.5%	33.9%	30.6%	30.6%

in full - customers are not satisfied over time unless a higher level of service accompanies the low costs. Rather, competing and developing a competitive hold by focusing solely on cost is not a long term satisfying strategy. Even Wal-Mart is re-positioning itself to be known for more than just low costs.

Second, there should be some alignment between a firms' strategy and their primary focus or objective for the planning period. For instance, a firm that uses a strategy to be the low cost leader should have as one of its primary objectives to reduce costs. What is interesting is that nearly 75% of the firms whose strategy is to compete on cost reported that their primary objective for 2006 is to reduce cost. This indicates a strong relationship (statistically significant) between objectives and strategy.

The relationship between a customer service strategy and its objectives was not as strong, as these firms focused almost equally on increasing satisfaction and reducing costs. Clearly, the customer service strategy is not solely focused on delivering higher and higher levels of service regardless of the cost. Ultimately, there is only so much service for which today's market is willing to pay.

Of particular interest is the strategy "Be all things to all people" where the objective of the firm was equally divided between reducing costs, increasing customer satisfaction and maximizing profitability. Much like the promotional pricing used by the automobile and airline industry, today's customers have become accustomed to getting it all - low cost and high service. In addition to the external customer dimensions, the mix strategy contains an internal dimension of helping the firm achieve its goal of maximum profitability. This strategy is the most complex to execute for multiple reasons including:

- product proliferation,
- the speed at which customer requirements change,
- the need of the supply chain to respond to changing business conditions,
- outsourced distribution and logistics functions,
- rising transportation and distribution costs, and
- the firm's pursuit of growth in existing markets and the entering of new markets.

Table 3 - Strategy and Objective of the Firm By Percentage of Respondents

Objective of the Firm	Strategy			
	Cost leadership	Customer service	Product innovation	Be all things to all people
Reducing costs	74.42%	27.78%	24.24%	30.90%
Maximizing asset utilization	4.65%	12.96%	10.61%	7.87%
Increasing customer satisfaction	4.65%	39.51%	30.30%	28.09%
Maximizing profitability	16.28%	19.75%	34.85%	33.15%

Firms employing a customer service strategy typically had sales under \$245 million; cost leadership firms had sales between \$1 - \$3 billion.

Supply chain leaders are engaged in or completed a supply chain network design within the last three years.

Finally, those firms that strived to be innovators in the market were most interested in maximizing their profitability, as well as increasing overall customer satisfaction. As with the cost leadership strategy, the objectives and strategy for innovators appear to be in alignment. Innovators typically work to increase profits and maintain or increase customer satisfaction.

The two strategies that appear to have the greatest differences were cost leaders and those employing a customer service oriented strategy. A typical firm using a customer service based strategy had sales less than \$249 million, and were definitely focused on increasing customer satisfaction. In contrast, firms with a cost-based strategy had sales between \$1 - \$3 billion. Customer service firms were working to reduce order cycle time (32%) while only 4% of the cost leaders were working on this initiative. Service firms were also looking to reduce uncertainty in the supply chain (21.5%) while only 3.8% of cost firms were attempting to reduce uncertainty. These differences highlight how strategy can drive the firm's goals and objectives.

Strategy also drives how one will organize the firm as it moves forward. Table 4 below highlights

that most firms have standardized processes at the domestic / international level, or at the business unit level. Few have standardized processes globally, and fewer still are decentralized. Standardization is vitally important to coordinating key activities with supply chain members. Furthermore, standardization enables synchronization of the key supply chain flows - information, products/goods, and financial. As a result, the higher the level of standardization, the higher the likelihood that optimal flows will occur in the supply chain.

What about supply chain leaders? By far, they are different from their peers in that they have standardized processes on a global basis, not just a domestic basis. While some of this standardization may have been driven by the need for increased supply chain integrity for security reasons, firms realized that standardization leveraged their efforts to achieve full visibility in the supply chain. Furthermore, standardization enables quicker deployment of new technologies to enhance supply chain performance. Because world-class supply chains are boundary spanning and global in reach, they need processes to be standardized and aligned to ensure the success of their efforts.

Table 4 - How Supply Chain Processes Are Standardized by Percentage of Respondents

Supply Chain Processes Are:	Percent
Standardized company wide regionally	30.2
Standardized at the business unit level	29.2
Standardized company wide globally	24.7
Decentralized	15.9

Strategic focus is one of the ways to define supply chain leaders. Typical classification schemes focus on the size of the company, type of industry, geographic location, or transportation spend, in order to determine if there are significant differences within each of these groups. How are large firms different than smaller ones? What are the major concerns of retailers compared to manufacturers? While these analysis provided some interesting insights, they did not produce any results that suggested that being a supply chain leader depends on size of firm, industry sector, or size of transportation budget. These groups are not as unique as most expect.

Another means of determining what constitutes a supply chain leader may be based on the types of technologies used within the supply chain. More sophisticated tools such as supply chain network design or inventory optimization are helping firms understand how the various elements (e.g. inbound transportation costs, inventory carrying costs, outbound transportation costs) affect the entire supply chain. These tools

and others such as replenishment planning, forecasting/ sales operations planning, pricing and promotions planning, and manufacturing planning, help firms identify cost savings. These enable firms to conduct dynamic, holistic analysis that will result in a much tighter integration between planning and execution. This is particularly important with the scope and complexity that is involved with global supply chains.

Recall the earlier discussion of the manufacturer with an entire logistics network designed to serve the customer's distribution centers. What happens when the customer changes the destination of their shipments, e.g. the retail store, with no allowance for change in cost. Supply chain leaders know that they must be able to support this change without negatively impacting their firm's profitability. Utilizing strategic tools like supply chain network design are the key to being able to effectively and efficiently deal with these types of changes. In fact, supply chain leaders may have already performed this type of analysis in anticipation of changing conditions. They have a better

92% of firms that spend between 4-5% of cost of goods sold on transportation have completed a supply chain network design within the last three years.

understanding of how market changes will impact their distribution network and transportation modes, and how to improve their processes.

In addition to optimizing their supply chain network, supply chain leaders have completed, or are engaged in the following efforts:

- Inventory optimization
- Pricing and promotions planning optimization
- Replenishment planning
- Forecasting / sales operations planning
- Manufacturing planning optimization

Table 5 - Strategic Supply Chain Initiatives

Technology	Supply Chain Leaders		Supply Chain Followers	
	Completed/ Engaged	Budgeted/ Future Plans	Completed/ Engaged	Budgeted/ Future Plans
Supply chain network design	100.0%		0.0%	68.7%
Inventory optimization (safety stock target setting)	77.9%	15.2%	53.3%	32.6%
Pricing and promotions planning optimization	50.4%	23.9%	31.1%	31.5%
Replenishment planning	76.1%	15.6%	56.2%	30.4%
Forecasting / sales operations planning	78.4%	14.3%	63.6%	27.6%
Manufacturing planning optimization	56.7%	19.6%	38.8%	30.2%

Whenever possible, replace inventory with information. To do so, you'll have to rely on your technology.

In all cases, supply chain leaders are using more strategic tools, and will have more technology employed in their supply chain compared to their counterparts. They are living by the adage: whenever possible, replace inventory with information.

What should you do? The key learnings from this section are fairly straightforward. First, supply chain leaders have spent a considerable amount of effort in standardizing their supply chain processes on a global basis. This standardization enables the synchronization of key supply chain flows - product, information, and financial. It also leveraged the efforts of the leaders to achieve true visibility in the supply chain. Second, supply chain leaders know that it is not enough to just have

common processes. They must also design a network that is capable of supporting the firm's strategy of "being all things to all people" under conditions of uncertainty and complexity. While this strategy is the most complex to execute, it changes the basis of competition for supply chains.

Optimized Planning

The logistics strategic plan is the blueprint for planning logistics and supply chain activities. Much like the carpenter uses the blueprint to know what size and type of house he/she will be constructing, the logistics strategic plan determines the scope and priorities for planning. The traditional planning period encompasses one to two years. While many firms still plan for this time horizon, they are also planning for shorter and shorter time periods. The ability to modify plans and change execution in a responsive time frame is a hallmark of world-class supply chain companies. Optimized planning is being able to satisfy demand while maximizing profit - even in the busiest months, under conditions of rising fuel prices, or both.

The growth in globalization has been made possible by logistics planning across supply chain members. A firm can source raw materials (or parts), manufacturer, and sell products anywhere in the world where it is feasible due to this expertise. Traditionally the aggregate logistics plan has focused on the enterprise itself. This scope was not sufficient for supply chain management that must consider upstream and downstream partners, many of which are global.

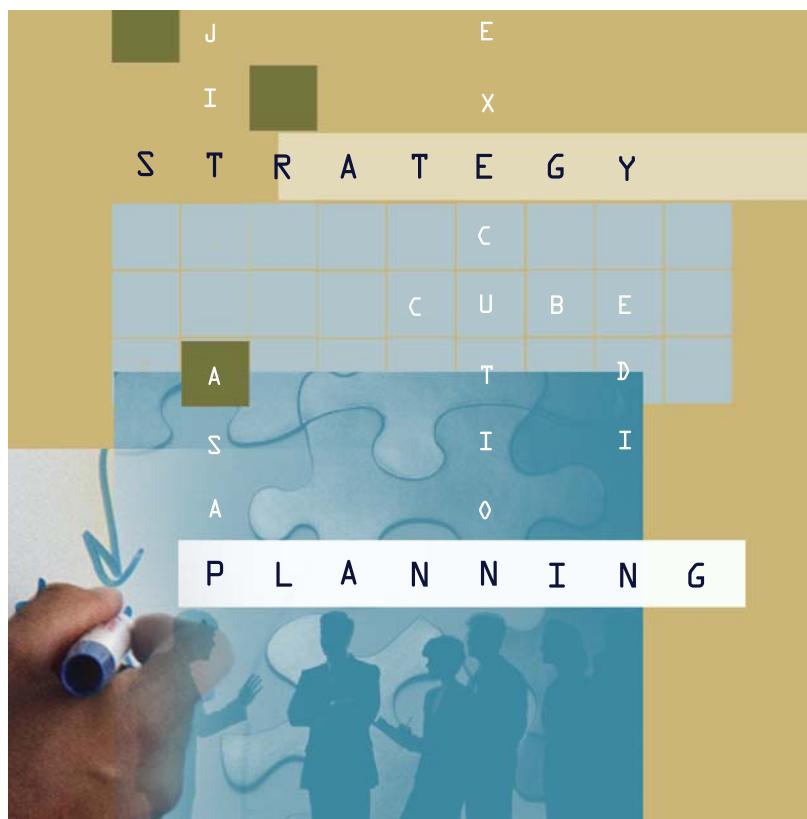
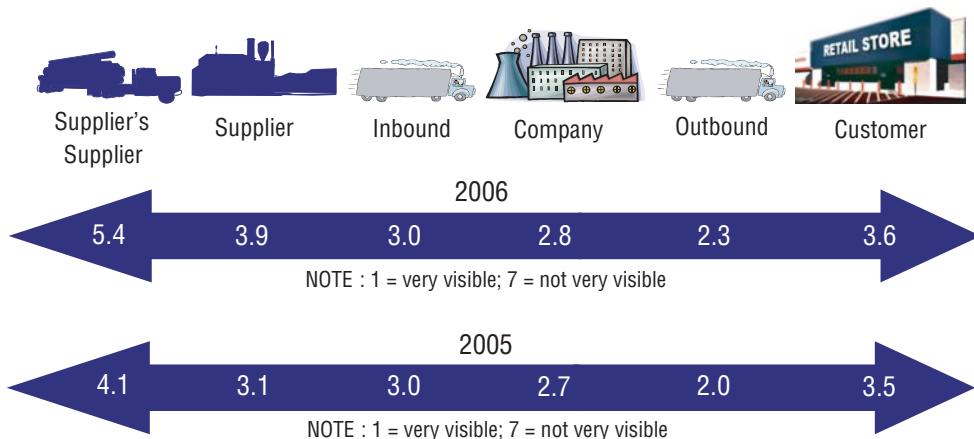


Figure 3 - Domestic Visibility - Composite Supply Chain Score



The ability to optimize planning relies on being able to see where product is in the supply chain. Optimal planning requires that a firm must anticipate demand and determine, before that demand occurs, how to best meet it. The critical element for optimal demand planning is visibility of information/data that is accurate and timely. Without this capability, managing the flow of products and related services is constrained. The results of this year's study show that overall visibility in the supply chain has decreased. We have presented the results in two formats in order to convey several dimensions of this important capability. First, there is a table with individual means and medians for each component; we have also provided a graphic illustrating and comparing differences between the two years.

Interestingly, half of the visibility remained relatively unchanged (within + 0.1). The three most visible components in 2005 are still the most visible components

in 2006. Outbound transportation was cited as being slightly less visible compared to last year (2.0 in 2005 and 2.3 in 2006). Overall, it is still the most visible of the attributes in the supply chain (Figure 3).

The biggest challenge to domestic visibility is seeing into the supplier and the supplier's suppliers' supply chain. Both of these areas saw significant reductions (Table 6). This could be due to increased expectations on visibility, technology constraints, or some basic differences in samples.

The reality of achieving seamless, real-time visibility is sobering when one considers that a supply chain consists of about 60 key data sources. When the data from these various sources are collected, integrated, and transformed into information for all the products and customers in a supply chain, the amount of information to be shared is almost impossible to comprehend.

Visibility of data/information exists at various levels. At the most basic level, visibility is limited internally to executive management at the business unit level. This means that each data source is an independent island; information sharing between supply chain partners as depicted in this example occurs sporadically and primarily by manual means - if at all. The scope of this type of visibility is not sufficient for any form of optimal planning, and most certainly will not assist the firm's evolution to a fully adaptive supply chain state.

Of course, anyone can say that they have visibility into their supply chain. Are there real differences between these groups? That is, are these firms working on or doing things that the other firms are not?

In order to answer these questions, the respondents were classified into two groups: a high visibility group and a low visibility group. If your score was 40 points or

Table 6 - Domestic Visibility - Average Responses by Attribute

	2006		2005	
	Mean	Median	Mean	Median
For your “average” customer:				
Finished goods inventory	3.27	4.0	2.88	2.0
Point of sale (POS) data	3.77	4.0	3.68	3.0
Demand forecasts	3.85	4.0	3.30	3.0
For your firm:				
Order processing	2.18	1.0	1.98	2.0
Finished goods inventory at the Plant	2.21	1.0	N/A	N/A
Finished good inventory	N/A		2.48	2.0
Work-in-process inventory	3.03	3.0	2.83	2.0
Raw materials inventory	2.99	2.5	3.13	3.0
Inbound shipments	3.03	3.0	2.80	2.0
Production schedules (own or contract)	2.89	2.0	2.84	2.0
Finished goods inventory at field DC level	2.15	1.0	N/A	N/A
Outbound shipments	2.28	1.0	1.99	2.0
For your “average” suppliers				
Inbound shipments	3.71	4.0	2.93	3.0
Finished goods inventory	4.30	4	3.3	4
Order status information	3.66	4	3.06	4
For your supplier’s supplier:				
Inbound shipments	5.29	7	4.09	4
Finished goods inventory	5.41	7	4.19	4

Note: 1=Very Important

less over a minimum of ten of the 16 domestic visibility variables, you were considered to have high visibility. Low visibility firms had scores greater than 40. Only those respondents that completed at least ten of the sixteen questions in this section of the research study were included for classification. For purposes of comparison, only these two groups were considered.

The level of visibility that a firm is able to achieve is not dependent on any of the items listed below.

That is, there are no significant differences between high and low visibility firms based on:

- Percent of sales dollars spent on transportation
- Transportation spend as a percent of cost of goods sold
- Type of industry
- Location in the supply chain
- Strategic focus of the firm
- Primary customer for the firm

Where are the differences? The study results indicate that high visibility firms have a significantly better view of their average customer's POS data than low visibility firms. This is also true for their visibility of the customer's demand forecasts. Internally, high visibility firms have a distinct advantage in that they have significantly greater visibility into activities within their four walls, including: inbound shipments, production schedules, raw materials inventory, work-in-process inventory, finished goods inventory at the plant and DC level, order processing, and outbound shipments.

In many cases, this visibility extends beyond the enterprise to include supply chain members. The analysis indicates that high visibility firms have significantly more visibility into their supplier's activities including inbound shipments, finished goods inventory, and order status information. The ability to see what is happening in the supply chain for high visibility firms continues further upstream to the supplier's supplier where they have visibility of inbound shipments.

What are the benefits of being a high visibility firm? Respondents were also asked to rank the measurable benefits derived from improved supply chain visibility. The results are clear: high visibility firms were better in seven of the nine areas (Table 7).

The analysis didn't reveal any significant differences in inventory turns or days sale outstanding. While efficiency gains in inventory are an expected benefit from increased visibility, there are several factors that may have counteracted this outcome. Product proliferation, equipment availability, modal capacity, port congestion, and global risk mitigation are just a few of the issues that have caused firms to manage inventory differently than in the past. Visibility alone won't resolve these issues that have a tremendous affect on inventory levels.

While the methods and tools that a firm uses to manage transportation and distribution activities have a significant impact on their ability to optimize planning, so does the quality and timeliness of the data itself. Speed matters. Information has the potential to transform the way in which supply chains can be managed for optimal efficiency and effectiveness. Information also impacts supply chain design; developing an integrated supply chain won't be possible without access and availability to information from demand to product returns. A major challenge in the supply chain is replacing disparate planning processes with synchronized supply chain activities to maximize performance. For this level of optimization to happen

across the supply chain, the various systems must be integrated to provide seamless, end-to-end data and information availability.

When this year's participants were asked to describe the manner in which supply chain data integration occurs, the largest majority reported that email was the preferred method to send and receive data. The optimal method of data integration - electronic data interchange (EDI) - is utilized by only 25% of the respondents (Table 8). The findings about data integration, however, are not entirely discouraging. The data in the table below indicates that only a very few study participants (0.6 percent) are not expending any effort to achieve supply chain data integration.

Visibility that enables optimized planning throughout the supply chain requires real-time (or near real-time) access to data and information in order to make adjustments as needed during the execution of supply chain activities. Today it is possible for transportation management systems to feed information into a warehouse management system, which in turn reports it to the enterprise resource planning system and other applications that are used in logistics and supply chain decision making. This level of data timeliness increases the supply chain's responsiveness - even in a world where things are constantly changing.

As Table 9 illustrates, the majority of data that is needed for optimal planning is available in a real time or daily for supply chain managers. The assessment of current state isn't complete, however, until these results are

Table 7 - Benefits Of Visibility By Percentage of Respondents

Benefits Derived From Visibility	High Visibility Firms	Low Visibility Firms
Improved performance on delivery to customer on promised date	4.40	4.10
Higher asset utilization	4.38	3.77
Reduced transportation costs	4.28	3.58
Reduced order cycle timer	4.26	3.87
Higher personnel productivity	4.12	3.45
Reduced variation in order cycle time	4.04	3.34
Improved cost of materials	3.94	3.18

Note: 1=Very Important

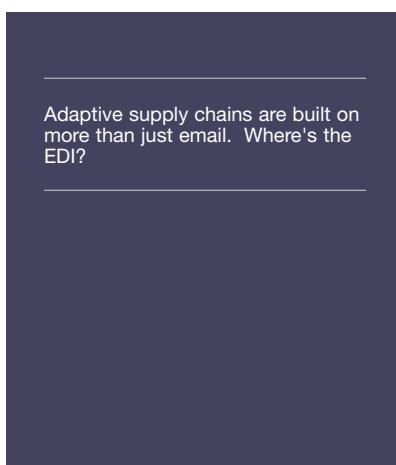


Table 8: Data Exchange Between Supply Chain Partners By Percentage of Respondents

	Percentage
Email	32.5%
Electronic data interchange (EDI)	25.0%
Internet	23.4%
Faxes and / or telephones	18.6%
No effort is currently being spent on supply chain data integration	0.6%

compared to previous years. The extent to which information is updated has remained virtually the same since 2004. The lack of progress in moving towards real-time information availability limits the ability to optimally plan transportation, logistics and supply chain activities.

A key follow up is to better understand which types of firms are actually getting this data in real time. For the nine areas in the table below, high visibility firms are more likely to get information updates for six of the areas faster than their counterparts. For four of the nine areas (demand forecasts, vendor order status, inbound shipment status and customer order status information) the information is provided in real time or at least daily. There were no differences in how frequently data was updated on the following attributes: production schedules, raw materials inventory, and finished goods inventory at the plant level.

What about firms that had completed a supply chain network redesign? The statistical results are even more telling. Except for raw materials inventory, supply chain leaders had more real time data available to them in the other eight areas than non-leaders. Supply chain design spans supply, production and distribution. It looks at multiple flows in the supply chain in order to optimize service and inventory levels. While supply chain design provides insight to the annual and quarterly decisions that must be made by the firm's management, it can also optimize safety stock locations and service levels based on demand for a given period. Most firms realize that supply chain design can move into tactical and operational areas as data sources are cleaned up and integrated to assist with short-term decision making. While it wasn't possible to ascertain which came first - redesign of the network or visibility in the supply chain - the conclusion is that firms with high visibility have leveraged this capability by designing networks

Table 9: How Frequently Is Information Updated At Your Firm?

	Real Time or Daily	Weekly	Monthly	Quarterly
Demand forecasts	41.7%	25.1%	22.6%	10.6%
Vendor order status information	36.1%	27.7%	8.4%	2.0%
Inbound shipment status	51.2%	16.3%	1.7%	2.2%
Production schedules	43.0%	26.8%	5.1%	4.3%
Raw materials inventory	32.4%	20.1%	12.4%	6.5%
Finished goods inventory at plant level	35.6%	13.7%	8.2%	4.4%
Finished goods inventory at field level DC	34.0%	14.2%	7.4%	3.1%
Outbound shipment status	44.4%	8.5%	2.7%	1.9%
Customer order status information	44.3%	9.5%	1.6%	1.6%

that are robust enough to deal with uncertainty and complexity.

One way that this visibility is achieved is through the use of technology. Tools and technology are important in assisting management in making the best decisions. Furthermore, they can provide a better understanding of the issues that impact the strategic direction of the firm. The participants of 2006 are more like our participants of 2004 than 2005. Commercially purchased software packages are still used more than the other categories, with "best of breed" distribution software increasing somewhat from last year. In addition to performing traditional activities, today's transportation technology is increasingly supporting information sharing and synchronization of other activities. As distribution and transportation become more complex and challenging, software packages developed in-house are often not sophisticated enough to efficiently and effectively manage transportation and distribution activities. Yet, the use of software developed in-house remains relatively constant, as does,

surprisingly, the use of spreadsheets. Some companies may be satisfied with spreadsheets and manual processes to manage these activities. It could also be that because transportation is not viewed as a value-added activity, it isn't possible to secure the funding and resources required for acquiring and implementing a different technology platform.

What should you do? The key learnings from this section focus on two areas: visibility of information and data, and the frequency of information updates. Supply chain leaders approach each of these in significantly different ways than their counterparts. They have developed broad and deep supply chain visibility. Broad in the sense that it enables vision of flows - product, information, and financial - upstream to the supplier's supplier and downstream to the customer. This high visibility also provides in-depth vision of the flows inside the four walls of the enterprise.

Supply chain leaders get information updated on a more frequent basis than other firms.

Table 10 - Primary Tools Used In Domestic Logistics Activities

Tools Used:	Transportation			Distribution		
	2006	2005	2004	2006	2005	2004
Commercially purchased software package that is part of our ERP	14.2	18.2	30	23.6	29.1	47
Commercially purchased "best of breed" software package	14.8	15.8		22.0	14.4	
Software package developed in-house	18.2	21.8	14	19.7	24.7	20
Manual / spreadsheets	25	21.3	25	20.5	15.7	18
Third party provider(s)	23.3	21.3	29	11.8	14.6	12
Other: _____	4.5	1.7	2	2.4	1.4	3

Information concerning demand forecasts, vendor order status, inbound shipment status, and customer order status is provided in real time or at least daily. This is a significant advantage for supply chain leaders as other firms have remained virtually the same in terms of information timeliness since 2004.

Optimized Execution

As noted earlier in this report, shippers have been dealing with rising transportation costs, capacity constraints, and service issues for several years. At first, many of these challenges may have been viewed as minor bumps, and not systemic changes to the environment. Yet, when it was apparent that the number and degree of challenges they were

facing would not abate soon, world-class supply chain professionals began to rely heavily on sophisticated planning tools to help them understand how to optimally react to the new conditions. In order to support the firm's strategic direction, new methods had to be utilized, requiring greater planning and knowledge at the execution level of the business.

Unfortunately, some firms focused solely on the execution component, hoping to solve problem without changes to strategy or planning. These efforts are shortsighted because they were only temporary fixes. In the long run, a basement that continually floods isn't kept dry by adding additional sump pumps, but by routing water away from the foundation. In like manner, supply chain professionals need to address the problem, and not just the symptoms.

One of the major systemic changes is how goods actually move through multiple distribution networks. A substantial percentage of firms are shipping directly to the customer (Table 11). In addition, they are also shipping product to their customer's DC or warehouse and the retail store. Servicing multiple distribution networks for customers requires sophisticated tools and techniques in order to optimize efficiency and effectiveness.

The classical distribution network involves shipping to the customer's distribution center (DC) or warehouse. It enables the firm to deal more effectively with demand variability across different



locations by pooling inventory in a centralized location(s). In general, this distribution strategy results in lower inbound transportation costs for the buyer or seller because of the volume loads that are moved.

Direct ship strategies are designed to avoid warehouses or DC's. One of the most significant benefits from this distribution strategy is that lead times are reduced. It is commonly used when the customer or retail store requires fully loaded trucks. In cases like this, moving the product through the warehouse or DC would not reduce transportation cost.

There are several disadvantages to shipping direct including a decline in the ability to centralize safety stock system wide (risk pooling), to reallocate product among different markets, and potentially higher transportation costs if smaller vehicles are needed to deliver directly to the customer or retail store.

Despite the disadvantages, shipping direct is a growing trend. It is an effective distribution strategy in e-fulfillment where customers require short lead times. Direct shipping provides the means for timely flow of product from business to the consumer, and it facilitates the

reverse logistics process from the consumer back to the business.

To have optimal execution across different and diverse distribution strategies, a number of capabilities are required. This is evidenced by the top five methods that shippers use to manage and control logistics and transportation activities. As shown in Table 12, internal visibility of orders is a primary execution capability, followed closely by the ability to select the right carrier. This was closely followed by tracking both inbound and outbound shipments. This is good news. Visibility into these factors at the execution level is an essential input to optimal planning. Ultimately, a firm's logistics and supply chain strategy will depend on these critical capabilities.

Table 11 - How Goods Are Shipped To the Customer

	Mean Response of All Respondents
Shipped direct to the customer	54.4
Shipped direct-to-store	36.6
Shipped international	19.5
Shipped to the customer's DC or warehouse	43.4

Table 12 - Percent of Respondents Having/
Using Current Capabilities

Attribute	Percent of Respondents
Internal visibility of orders	81.4
Carrier selection	79.1
Tracking outbound shipments	78.5
Tracking inbound shipments	73.5
Consolidated shipments	69.1

This is contrasted to the other end of the continuum where methods / tools that require integrated planning and execution to deliver optimal performance are found. Vendor managed inventory and JIT (lean) replenishment require tight integration between members of the supply chain. The strategic partnerships that are developed change the way that information is shared and how inventory is managed within the supply chain. More respondents are not considering developing the capability to use diverted shipments or merge-in-transit shipments than actually use these methods.

Table 13 - Percent of Respondents Having/
Using Current Capabilities

	In Use	Not Considering
Vendor managed inventory (VMI)	44.3	30.0
JIT (lean) replenishment	39.2	22.9
Continuous moves / backhauls	37.5	37.9
Divergence of shipments	34.3	37.6
In-transit merges	21.7	54.7

Throughout this report we have compared and contrasted the supply chain leaders to other firms. In terms of execution, the list of differences is long: supply chain leaders are significantly more likely to be using more tools and techniques to manage their supply chain. These findings apply to supply chain leaders that have completed a supply chain redesign, as well as those that have high supply chain visibility.

Without visibility into the supply chain, it will be nearly impossible to optimize day-to-day, and sometimes hour-to-hour, activities. The results of this study confirm that firms that understand the value of visibility are using significantly different capabilities to manage transportation, logistics and supply chain activities than those firms that have limited visibility in their supply chains.

While high visibility firms and firms that have redesigned their supply chains share the majority of supply chain capabilities, there are some interesting differences.

What should you do? Firms have spent a lot of time and effort trying to optimize supply chain performance via execution. What they forgot was that the most efficient supply chain is not always comprised of members striving to attain a local optimum. The goal is to have the entire supply chain operating at a global optimum. This can only be accomplished when execution, planning and strategy are aligned and tightly integrated. Focusing solely on execution leaves the firm and the supply chain vulnerable to unanticipated changes in a dynamic marketplace. It will ultimately lead to sub-optimal

supply chain performance. Perhaps this is the key learning from this section. While the tools and techniques that are used by the supply chain leaders are significantly different than other firms, the execution tool box alone will not be sufficient to realize the power of O³.

Table 14 - Supply Chain Leaders Capabilities

Attribute	Firms That Completed A SC Redesign	High Visibility Firms
24 hr. custom notification	x	x
Alerts to late or delayed shipments	x	x
Appointment scheduling		x
Consolidated shipments	x	x
Continuous moves / backhauls	x	x
Cross docking at distribution centers	x	
Dedicated transportation	x	x
Divergence of shipments	x	x
Domestic visibility of orders	x	
Drop- ship programs	x	x
Electronic tendering of shipments	x	x
Internal visibility of orders	x	x
International visibility of orders		x
In -transit merges	x	x
JIT (lean) replenishment	x	x
Rating/contract management	x	
Routing/scheduling optimization	x	x
Tracking inbound shipments	x	x
Tracking outbound shipments	x	x
Vendor compliance	x	
Vendor managed inventory (VMI)	x	

The Power of O³
will change the basis of
competition.

The Power of O³: Assessing the Gap Between Supply Chain Leaders and Followers

We know what you are thinking.

Why work hard to reach the power of O³?

Because, in the end, this power will change the basis of supply chain competition. Being a supply chain leader in the simplest form means survival. The inability to make better decisions over shorter and shorter time periods will ultimately lead to total supply chain inefficiencies. You have to get better in order to compete.

Supply chain management and technology has enabled the firm's reach to become global on a real-time, 24/7 basis. While the boundary spanning nature of supply chain management has begun to link companies more closely, it has also created increased complexity for the process of getting the right product to the right place, at the right time, in the right quantity, for the right customer, at the right cost and condition. The business environment isn't making it any easier to deal with this complexity. Firms are struggling to balance the trade-offs involved in keeping service levels high and cost as low as possible. All of this has increased the focus on determining the "best" approaches for what, where, and when. Hence our focus on optimization for this year's study.

Harnessing the power of O³ - optimized strategy, planning and execution - is challenging; for some it is often an elusive goal. Several common threads exist in

firms that are leaders in creating the optimal supply chain. First of all, they have significantly greater visibility into their enterprise and across the supply chain than do other firms. This end-to-end visibility across processes and regions is the enabler of flexibility and agility that is so essential to maximizing value in the supply chain and will ultimately serve as a critical foundation to pursue O³.

The second common element of leaders in the quest was having supply chain processes that are standardized company-wide on a global basis. This level of standardization is vitally important to coordinating key activities with supply chain members. Furthermore, this state of standardization enables synchronization of the key supply chain flows - information, products/goods, and financial. Last, but not least, the leaders understand the role of strategic tools such as supply chain network optimization in assisting the firm to reach the desired end state of O³.

As these key supply chains continue to expand globally, the forces of O³ will converge on important decisions for leaders regarding technology and business process outsourcing. Does the technology infrastructure provide the company with the backbone to scale operations globally to enable the essential mix of business process orchestration and business insight that affect each user? Do operations excel across the globe, or will certain elements be handled better by a Logistics Service Provider?

With supply chain visibility in place, leaders understand that the next step is to use that foundation to create an expanded collaborative environment that drives the supply chain formula across the order-cash flows as well as optimizing strategy, planning, and execution's performance and value.

In addition to the collective elements discussed above, the study results suggest that each area contain critical components that are needed for attaining the desired optimal state. Key findings from each are presented in the following sections.

Optimal Strategy

Very few logistics professionals would disagree with the need to have a logistics and supply chain strategy that is aligned with the corporate vision and direction. It is also vitally important that the "C" level needs to understand how the supply chain works, and how it can support a winning strategy for the firm. Optimal strategy requires tight integration between all the levels. Without the tight linkage of strategy between the levels and across the functions, goals and objectives will be misaligned and fail to achieve the desired results. While we have seen progress in this area over the past few years, a lot of work remains to be done.

Embarking on strategy initiatives is a daunting task as today's supply chains touch more borders, require collaboration across a growing number of processes, and involve more parties, languages and currencies. One key enabler to support these decisions are

business analytics that look at opportunities from many perspectives including the customer, production, logistics, and most importantly, financials. Typically, these views are held in separate applications like CRM, ERP, WMS, and TMS making it difficult to see the total picture. Today's business intelligence can work across such applications in a heterogeneous environment to offer insight and analysis of business critical information that will drive and shape strategy.

Optimal Planning

The value of information has long been noted in the logistics and supply chain literature. Yet, here we are in 2006 still emphasizing the benefits of having access to real time, end-to-end information flows. Ideal access requires that data and information be available to all supply chain members at the point closest to demand since it takes time to respond to changes. There is some very good news in this area. The majority of firms are using point-of-sale data from their most important customers as the "trigger" for replenishment. This has replaced the less timely, disconnected method of periodic review at the store and warehouse/DC level.

There is still a significant amount of work to be done in terms of timeliness and end-to-end flow of data and information. Email remains the most predominant method in which supply chain data is sent and received. This has profound implications for end-to-end flow. Even more troubling is the fact that some 18.7% of the study participants are using faxes and/or telephones to achieve supply chain data integration.

Supply chain leaders are leveraging the knowledge gained from strategic initiatives such as forecasting/sales operations planning, inventory optimization, supply chain network design, and manufacturing planning. In addition to providing valuable insight relative to strategic issues, these initiatives enable the firm to optimally plan for shorter and shorter time horizons. The ability to modify plans and change execution in a responsive time frame is a hallmark of world-class supply chain companies.

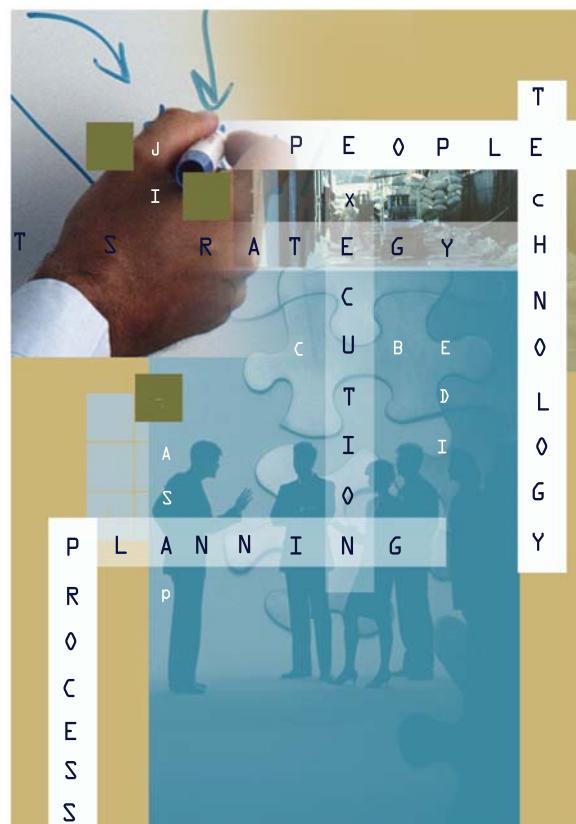
The good news is that technology has made incredible advances to drive toward optimized planning and ultimately enable a consumer demand driven collaboration and fulfillment based supply chain. Technology can enable best practices around strategic network optimization reviews to determine where optimally to place assets. Sophisticated algorithms on the order management side can distribute orders most effectively to the correct sources and into the most effective fulfillment flows. In the end, the deeper these planning tools reach into the supply chain the bigger their influence is on behavior and execution. This will determine to what degree optimization of planning is achieved.

Optimal Execution

The results of all the firm's efforts will be measured and assessed in the execution phase. This is the point where customers and supply chain partners determine how far from optimal was the firm's performance. There is some troubling news relative to the tools and techniques that are used to manage domestic distribution and transportation.

The percentage of firms using spreadsheets/manual techniques increased more than expected from 2005 to 2006. Given the current complex and challenging supply chain conditions, a more sophisticated approach is needed to achieve optimal execution. The firms that are making the most progress in reaching the desired state of O³ are utilizing a wide array of tools and techniques. These tools enable the firms to conduct dynamic, holistic analysis that results in tight integration between planning and execution.

Two very important components of optimal execution should be discussed. Global companies are looking to business process outsourcing (BPO) best practices to expand the capabilities of their supply chains. As managers review business processes and



Nurturing trust in the supply chain will require the guidance of the strategic leaders of the organization – the “CXOs”

execution, they are attempting to expand their capabilities with BPO options across the entire supply chain. With its global networks and supply chain expertise, logistics service providers are well positioned to take full advantage of this continued spike in BPO trends for more supply chain outsourcing.

Second, service orientated architecture (SOA) technologies are now leading the charge to deliver business process orchestration across the supply chain. Processes for managing customers, capturing orders, fulfillment, financials, and analysis were often executed in separate processes and with separate applications. As a result, a silo behavior developed within the four walls of most companies that contributed to different strategy, planning, and execution paths. SOA architecture enables the integration of best practices from each process to deliver the most complete form of order-cash optimization. Furthermore, being standards based, this integration can expand to include the full trading community of suppliers and service providers increase the business process orchestration scope and impact. Going forward, SOA architecture will be the prime enabler for supply chain leaders to achieve their sought after competitive advantages.

Still not convinced of the value of O³? Perhaps a reminder of the benefits that high visibility firms have derived from integrating their logistics and supply chain activities would be helpful.

The leaders were significantly better in the following areas:

- Improved performance on delivery to customer on promised date
- Higher asset utilization
- Reduced transportation costs
- Reduced order cycle time
- Higher personnel productivity
- Reduced variation in order cycle time
- Improved cost of materials

Wouldn't you like to achieve the same results?

Our Collective Point of View

When we hear the word optimization in the context of supply chain, we immediately think of tools that will help us to calculate a low cost solution to a complex problem. Indeed such tools are available. It should be noted that these are "decision support" tools and they are a part of the optimization process, and not even the central part of the process. The core capability in optimization of the supply chain lies in our people.

This research team has previously named six drivers of supply chain excellence. These are Visibility, Speed, Connectivity, Operational Excellence, Collaboration, and Optimization. These same attributes apply not only to an organization, but to a functional department and the people in the organization. When asked by client to describe the type of people needed to populate a leading supply chain organization, we suggest a professional Logistician with attributes that are consistent with our six "success drivers."

Visibility - Ability to see and to be seen. This person has a capability to view the overall process and to comprehend the entirety of the network that makes up a organization's supply chain. From planning through buying to making and delivering, they should understand the key metrics and understand how the functions relate. In addition, they should have the executive presence to stand up and articulate to the other business functions and to management the strategy and tactical vision of supply chain functions within an organization

and that the organization's network.

Speed - A decisiveness and sense of urgency. An organization gets its sense of urgency from its people. Having a dedication to be of service and in delighting the customer - internal or external customer, with rapid, meaningful response is the hallmark of great Logisticians and great companies. This attribute brings with it a tolerance for mistakes for we learn by doing and in doing we have to decide in a timely manner, based upon imperfect knowledge, and move on.

Connectivity - An ability to socialize and communicate effectively. In our 2004 study we elaborated on the broad subject of connectivity in the technology and contractual sense. For people the term refers to the ability proactively seek a network that can help complete the mission. Today this means global connectivity. We will increasingly need to network people to people across cultures and geographies. The skilled Logistician can negotiate and persuade and is also open to persuasion and can project trust so that agreements can be reached at a distance and with minimal legalisms.

Operational Excellence - Education and skills to perform the tasks required. The effective Logistician is educated and trained in the trade. A key understanding of how the many parts of a transaction result in the exchange of goods, information and funds while creating value in both time and space. At any given point in ones career an individual can be responsible for a Plan, Buy, Make, Move or Service function.

Operational excellence implies we are performing at a best-in-class level in our own tasks while supporting the entire supply chain through information so others can raise their own performance levels.

Collaboration - Ethics and empathy to strive for win-win solutions with trading partners and with fellow employees. The leadership traits in a collaborative person are demonstrated by BOTH decisiveness as stated in "Speed" and also openness to an iterative approach. That is when multiple parties contribute to the best solution through methodical review and progression. This person is ethical and engenders a spirit of fairness and mutual respect in their dealings.

Optimization - Demonstrated ability to improve cost and service through creative and efficient problem solving. People who do not solving complex puzzles dealing with the creation of time and place value usually don't stay in Logistics. For several millennia there have been transporters moving goods to market by solving navigation and mobility problems. Today we have tools to help us make optimum decisions. These tools have to be configured by people who understand the parameters of the service and cost problem. The Logistician should feel confident that, given time and resources the solution will be optimum.

An individual endowed with these six attributes will make a fine candidate for inclusion in a best-in-class Supply Chain management team. Add the right tools and a competitive network with similar characteristics and you have a winning organization.

Looking Forward

Over the past six years we have examined the drivers of world class supply chain management. For all the knowledge that we gained along the way, we have also unearthed many more questions about the drivers. In particular, the lack of significant progress in implementing visibility within the four walls of the firm, and across the supply chain, suggests that we do not fully understand what issues hinder the firm from reaching the desired end state for this capability. We also believe that many of the answers that firms are seeking as to how to reduce logistics costs and improve service can be found through a deeper examination of the drivers. In future research we will continue our exploration of the impact of the drivers to supply chain performance. We aspire to provide a better understanding of the issues and challenges that firms face in transforming themselves into adaptive, flexible entities.

Technology is ready to help solve the supply chain puzzle. Getting past the hype will surely be complicated. It has been well documented that the rise and fall of businesses will be determined by which companies win the global supply chain war. Strategy, planning, and execution combine to shed their silo behaviors and perspectives of the supply chain to enable effective business process orchestration that closes the gaps between operations and business growth.

The power of O³ is ready to help you solve your supply chain puzzle. Are you ready to play?

The Authors

Dr. Karl B. Manrodt

Dr. Manrodt is an Associate Professor in the Department of Management, Marketing & Logistics at Georgia Southern University. An active member in CSCMP, he served 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.

Dr. Mary Collins Holcomb

Dr. Holcomb is an Associate Professor of Logistics at the University of Tennessee. Her research interests focus on two related areas of strategic logistics and supply chain management: process design and metrics. Her teaching interest includes logistics and supply chain principles and analytical methods. Her work has appeared in the Journal of Business Logistics, Transportation Journal, and Supply Chain Management Review. Her professional career

involved some eighteen years at the Oak Ridge National Laboratory in transportation research and policy issues for the U.S. Department of Energy, U.S. Department of Transportation, and the U.S. Department of Defense. Dr. Holcomb's background also consists of varied industry experience with Milliken & Company, the former Burlington Northern Railroad, General Motors, and two years of collaborative research with Procter & Gamble. She is on the editorial review board for Quality Management Journal, and is a former editor of the Transportation Energy Data Book.

Mr. Michael Riegler

Mike Riegler is the Director for LSP Industry Strategy at Oracle. He is responsible for product development strategy and vision across applications and technology for Oracle. Prior to Oracle, Mr. Riegler spent thirteen years working in the LSP industry, and joined G-Log as a business consultant. In this capacity he served as a project director in Europe for four years before returning to the US as a product marketing director.

Mr. 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 Companies

Capgemini

Capgemini is one of the largest consulting, technology and outsourcing services firms in the world and is publicly traded on the Paris Bourse. The company offers process improvement consulting, systems integration, technology development and design, and outsourcing capabilities on a global scale to help traditional businesses continue to explore growth strategies in the new economy. The organization employs more than 57,000 people worldwide and reports global revenues of over \$5.5 Billion Euros.

Capgemini develops sector-specific supply chain solutions for the Automotive, High Technology, Life Sciences, Financial Services, Healthcare, Government, Retail/Consumer Products, Manufacturing, Telecommunications, Distribution, and Chemicals industries. The Capgemini goal is to help clients increase shareholder value with speed and efficiency by getting closer to their customers, collaborating with suppliers, leveraging emerging trading communities, and making use of information flowing within and across company and geographic boundaries.

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 publishes 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 or www.manrodt.com.

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 <http://www.mlt.bus.utk.edu>.

Intel Corporation

Intel, the world's largest chip maker, is also a leading manufacturer of computer, networking and communications products. Additional information about Intel is available at www.intel.com/pressroom.

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.

For more information on Oracle, visit our website at
<http://www.oracle.com>

For more information on Oracle SCM, visit our website at
<http://www.oracle.com/applications/scm>

Contacts

For more information on how to address the challenges and opportunities discussed in this report or to obtain additional copies of this publication, please contact:

Karl B. Manrodt, Ph.D.
Associate Professor of Logistics
Department of Management,
Marketing & Logistics
P.O. Box 8154
Georgia Southern University
Statesboro, GA 30460

Direct: 912.681.0588
Fax: 912.871.1523

kmanrodt@georgiasouthern.edu
<http://www.manrodt.com>

Mary Collins Holcomb, Ph.D.
Associate Professor of Logistics
Department of Marketing &
Logistics
316 Stokely Management Center
University of Tennessee
Knoxville, TN 37996-0530

Direct: 865.974.1658
Fax: 865.974.1932

mholcomb@utk.edu
<http://www.maryholcomb.com>

Peter D. Moore
Vice President
Logistics & Fulfillment/RFID
Capgemini, U.S. LLC.
600 Memorial Drive
Cambridge, MA 02139

Direct : 617.768.5435

peter.moore@capgemini.com
<http://www.capgemini.com>

Mike Riegler
Director- LSP Industry Strategy
Oracle
1016 W. Ninth Ave, Suite 300
King of Prussia, PA 19406

Mike.Riegler@oracle.com

Direct: 610.491.3367
<http://www.oracle.com>

The authors want to thank Capgemini, Oracle, and Intel Corporation for demonstrating their thought leadership and commitment to supply chain excellence in sponsoring the 2006 study.