

GAME-CHANGING TRENDS IN SUPPLY CHAIN

FIRST ANNUAL REPORT BY THE
SUPPLY CHAIN MANAGEMENT FACULTY
AT THE UNIVERSITY OF TENNESSEE

SPRING 2013

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TEN GAME-CHANGING TRENDS
IN SUPPLY CHAIN

FOUR KEY AREAS OF
COMPETENCY

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GAME CHANGERS

TABLE OF CONTENTS

Introduction	3
Customer Service to Customer Relationship Management	5
Adversarial to Collaborative Relationships	10
Incremental Change to a Transformational Agile Strategy	14
Functional Focus to Process Integration	19
Absolute Value for the Firm to Relative Value for Customers	25
Forecasting to Endcasting (Demand Management)	31
Training to Knowledge-Based Learning (Talent Management)	36
Vertical Integration to Virtual Integration	41
Information Hoarding to Information Sharing and Visibility	45
Managerial Accounting to Value-Based Management	49

GAME-CHANGING TRENDS IN SUPPLY CHAIN INTRODUCTION

Every month a new article or conference lecture seems to present a fresh idea about the game-changing trends faced by supply chain professionals. Consulting companies, academics, and even individual companies have their own opinions about and definitions of supply chain megatrends. Often these megatrend lists do not match; instead they reflect the backgrounds and experiences of the people who compile them.

For this white paper, we define game-changing trends as *those trends that meet the two basic criteria of being extremely impactful on a firm's economic profit and shareholder value, as well as very difficult to implement successfully.*

The 10 game-changing trends discussed in this white paper have their foundations in a 2000 landmark study co-authored by Ted Stank on our faculty. That study and the updated version incorporated responses from approximately 150 supply chain professionals across a wide range of industries (retailers, manufacturers, and service providers, large and small in size). But that doesn't mean the material in this white paper is dated—far from it. Based on our interaction with literally

hundreds of companies annually (the largest industry network in the academic world), we believe that those trends still serve as a foundation. But the supply chain world has drastically changed over the past 13 years. In this white paper, we'll discuss the game-changing supply chain trends that you need to squarely face today, and we'll suggest how to make progress toward the desired end state. We'll also use plenty of examples along the way.

When a student asked Albert Einstein if this year's physics exam questions were the same as the previous year's, he responded, "Yes, but unfortunately for you the answers are very different." Our game-changing trends are like those questions. We still see some of the same supply chain trends, but the real world responses to them are dramatically more sophisticated.



A GAME CHANGER changes the way that something is done, thought about, or made. Henry Ford was the epitome of a game changer. His revolutionary new mass-production methods, including the world's first moving assembly line for cars, made automobile ownership affordable for many middle-class Americans.

Eight members of our supply chain management faculty collaborated to identify 10 game-changing trends and then write this document. The 10 trends align perfectly with the research of these faculty members. (The University of Tennessee is ranked No. 1 in the world in supply chain management research.) And we tapped our wide ranging experience with industry leaders through our global forums, executive education, and consulting.

This document will give you a brief synopsis of today's leading thinking about 10 game-changing trends in supply chain:

1. **Customer service to customer relationship management**
2. **Adversarial relationships to collaborative relationships**
3. **Incremental change to a transformational agile strategy**
4. **Functional focus to process integration**
5. **Absolute value for the firm to relative value for customers**
6. **Forecasting to endcasting (demand management)**
7. **Training to knowledge-based learning**
8. **Vertical integration to virtual integration**
9. **Information hoarding to information sharing and visibility**
10. **Managerial accounting to value-based management**

In the last two months of 2012, over 160 supply chain professionals were surveyed to assess these 10 trends in industry, as well as how those trends have changed. While they will be expanded in the body of the white paper, below are some highlights of that survey:

- Firms have made significant and in some cases surprising progress in the last decade and in each of the 10 areas.
- Some companies have achieved top levels of performance in individual categories, although no firm has excelled in all categories. Thirteen years ago, no one reported a top level of performance in any category.
- There are laggards in each category as well. These firms appear to be fighting the same battles in the same way.
- Respondents feel that most progress has been made in customer relationships and cross-functional integration. Firms seem to be better focusing on their customers outside the firm and shoring up the emphasis on cross-functional processes inside the firm.
- Talent management clearly emerges as the linchpin required for advancement in all areas.

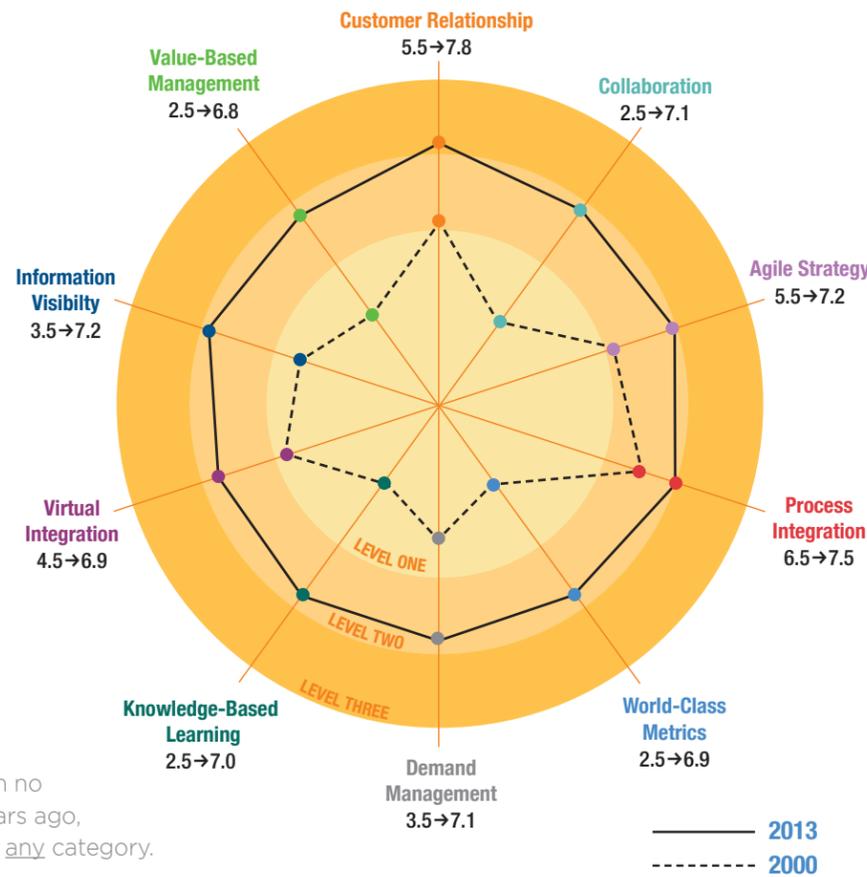
The remainder of this white paper is divided into 10 sections, one for each trend. We've used the survey information as one input but also included the leading edge thinking from all of our research and industry contacts.¹

—J. Paul Dittmann

¹Don Bowersox, David Closs, and Ted Stank; Ten Mega Trends That Will Revolutionize Supply Chain Logistics

GAME-CHANGING TRENDS EVOLUTION

Firms have made significant progress in the last decade in each of the ten areas.



CUSTOMER SERVICE TO CUSTOMER RELATIONSHIP MANAGEMENT

BY TED STANK, Ph.D.
Harry J. and Vivienne R. Bruce Chair of Excellence in Business



WHY IS THIS A GAME-CHANGING TREND?

Customer relationship management remains a game changer for all companies because it requires customer prioritization to maximize revenue and profitability by targeting limited resources. Few would disagree that this needs to be done; yet we find that few companies actually create customer focused, differentiated supply chain plans. This requires tough choices that are sometimes unpopular and often engulfed in politics. But a few leading firms have truly embraced this game-changing trend that is gathering momentum.

One medium sized retailer, a member of our Supply Chain Forum, survived the Great Recession by focusing on critical customers. They confirm that this segmented customer focus was the crucial element in a strategy that allowed them to take out 48% of their inventory while still improving on-shelf availability from 96% to 98.8%.



PROGRESS MADE BUT MORE NEEDED

We have come a long way as a profession by changing our focus from merely providing excellent customer service to actually managing relationships with targeted customer segments. What will it take to reach the next level in managing customer relationships? Before answering that, let's reflect on the progress made.

In the 2000 landmark study referenced above, the authors noted that the customer service to relationship management trend was one of the most advanced game-changing trends. On a scale of 1 to 10, with 10 being total adoption and 1 representing no meaningful acceptance, it had achieved a 5-6 level of maturity. The prediction was that by 2010, organizations would be operating close to the total adoption level, a score of 10. The research supporting this white paper suggests that industry has continued to improve on this trend, although most organizations still have not achieved total maturity. The average among the firms responding to the 2012 survey was 7.85, with a range (at one standard deviation) of 5.88 to 9.82. The important takeaway is that while some leading firms have pushed close to total adoption, a

significant number of organizations may be considered laggards in adopting this game-changing trend.

MANY FIRMS STILL OPERATE WITH A TRADITIONAL SERVICE MINDSET

The traditional approach to customer service was standardizing service for all customers. The original study showed that many firms operated from a traditional service mindset while industry had progressed toward managing each customer or customer segment as a unique service relationship. It should be noted that by understanding true "Cost-to-Serve" of a client/product segment, a company can more effectively allocate/charge for the services provided/consumed.

Companies recognized that supply chain performance on dimensions like in-stock availability and on-time delivery were critical to the buying process. Thus they developed standard operational capabilities to facilitate standard and uniform levels of service delivery to all customers. With that focus, achievement of internal performance goals and targeted operating standards were indicators of success (e.g., on-time delivery, shrinkage levels, number of customer complaints, etc.).

CUSTOMIZING SERVICE OFFERINGS PROVIDES AN OPPORTUNITY TO BECOME AN INTEGRAL PART OF A CUSTOMER'S BUSINESS.



FROM A HIGH LEVEL OF STANDARD SERVICE TO CUSTOMIZED SERVICE

Improving operational effectiveness for all customers is, of course, highly desirable and may be considered a building block toward gaining competitive advantage. However, business success derived from a focus on standard levels of service effectiveness is usually short-term at best. The managerial tools and techniques utilized are typically easy to imitate, so performance differences gained from such programs are difficult to sustain in a tough competitive environment.

In addition, a traditional customer focus that results in standard levels of service for every customer risks creating value that misses the mark for all customers. For example, delivery features like shortened cycle times and exact point in time delivery may be the prime drivers of performance for some customers. But others may prefer average or lower levels of delivery support rather than pay the cost of such high level operations. Thus service delivery should reflect the unique requirements of each customer.

Customizing service offerings that already demonstrate high levels of operational excellence provides an opportunity for a supplier to become an integral part of a customer's business. A supply chain based on close customer relationships has the greatest potential to generate unique solutions that combine elements of timeliness, availability, and consistency to exactly match desired values at prices customers are willing to pay.

Creating close customer relationships helps a firm identify the long-term requirements, expectations, and preferences of current and/or potential customers. It also enables the firm to develop operational configurations that deliver tailored supply chain delivery with optimal profitability. A company may attain a competitive edge through close customer relationships. Those relationships enable them to become more proactive with customers, anticipate customer expectations, and measure the extent to which customers' needs are satisfied.

MULTIPLE SUPPLY CHAIN CONFIGURATIONS ARE REQUIRED

To generate a unique delivery value tailored to specific customers or customer segments, firms will have to create multiple supply chain configurations. This tailored approach to customer service requires a huge investment to establish close relationships and deliver customized value. That investment is a major challenge.

No firm possesses sufficient resources to successfully meet the exact needs of every potential customer or market segment. Firms are forced to focus resources on selected customers and segments that represent the best exchange opportunity for the type of value created by the organization. The firm must decide where to compete and where not to compete based on the fit between firm strengths and customer needs.

The success of the tailored service relationship depends, therefore, upon the firm's managers' understanding of their strengths in comparison to the differing needs and desires of each customer or customer segment. Once the specific needs of each customer or segment are understood, the segments must be prioritized based upon their strategic importance and their potential for economic profit.

While this game-changing trend was first envisioned for manufacturers serving business customers, it may become the standard operating procedure for retailers as they increasingly move into multi-channel supply chains. In a multi-channel retail case, the prioritization would be focused on the preferred channel rather than on the specific customer.

THE FALLACY OF BEING ALL THINGS TO ALL CUSTOMERS

Highly volatile competitive environments often pressure firms to abandon the segmented service relationship approach and focus on trying to be all things to all customers. During such times, senior management becomes fixated on the mass market and loses sight of the costs and asset commitment needed to deliver unique value to customers. The result is that

both financial and human resources are dedicated to customers or customer segments that are unlikely to generate a profit. Though such short-term strategies can augment cash flow in the near future, they are inevitably damaging to profitability and earnings.

Other competitive scenarios can create monopolistic-like competition in customer markets and lead to the opposite problem: organizations with minimal viable competition may focus unduly on supply chain efficiencies across the entire customer base to the detriment of creating customer value, thereby eroding service levels in the pursuit of low cost/low asset operations. Neither excessive focus on customer effectiveness nor excessive focus on supply chain efficiency presents an optimal strategic situation. Each de-emphasizes the importance of understanding the needs of each major customer or customer segment and then matching that with the appropriate service configuration. The goal is to create customer value commensurate with the economic profit potential of the relationship.

CHALLENGES OF PRIORITIZING SERVICE LEVELS

A couple of factors are at work here, namely *service levels* and *service level offerings*. In addition, there are differences by industry. In all cases, there is a need to prioritize by customer. Firms face numerous challenges as they seek to focus their resources more on prioritizing service to customers of choice. First, marketing and sales organizations typically are reluctant to cast any paying customer in a role of “less important.” This often has less to do with desire and more to do with a lack of accurate and timely activity based costs tracked to specific customers to enable a reasonable analysis of customer profitability.

If the actual profitability, both current and future, of customers is not clear, prioritizing service could be fatal. Still, some firms have begun allocating costs to customers on activity drivers that are more meaningful than the standard usage of percent of sales.

Percent of total orders placed or percent of total volume per order could more meaningfully approximate a true cost-to-serve.

A second challenge to prioritization is a lack of useful implementation tools. For example, the order management systems in most companies cannot “hold” inventory so that a top customer would be prioritized over less important customers during stock outs. Also, top customers often demand shorter order cycle times and inventory may be listed as not available (as it was already promised to another customer) by the time the customer of choice places an order. Some progress in this area has been made by assigning customer teams that may manually override system designations. Recent advances in inventory optimization software now let manufacturers automate the process of managing different service levels for different customers within a specific distribution center.

The research partners at Ernst & Young have adopted an extension of the relationship management idea. The concept, called Service Stratification, applies not only to service differentiation by customer segment, but also involves the concurrent differentiation by product group and product offerings. Stratification of service levels and offerings on the basis of customer and product value-based groupings requires organizations to establish a holistic perspective of both customer and product value. Leading companies have developed a robust governance structure to drive consistent execution of segmentation strategies. The operational impact of stratified service policies can be demonstrated at the execution, tactical, and strategic levels of a company’s supply chain.

Successful execution of service stratification requires multiple steps:

1. Define business policies and rules: The first step is to define the categories within the service stratification, for example, what constitutes an A, B, or C product/customer, based on the company’s business model? For each category, a set of business rules should be developed that indicate how



each category in the matrix should be treated.

2. Integrate business policies: Next, the business has to integrate the business rules into daily processes across the firm at the strategic, tactical, and executive levels.
3. Develop policies that are automatic/systematic to drive the most value: The final step, which promotes continuous improvement, is to start to automate policies and procedures within the processes that will create high value if automated.

Software exists to model and optimize inventory, taking into account different service levels for different customers or channels—same item, same DC, but different service levels. Optimizing as a group instead of individually as a specific customer class significantly reduces overall stocks by location.

The following case provides an example of a firm that has established close relationships with select customers to provide differentiated levels of service that enhance the value provided to customers.

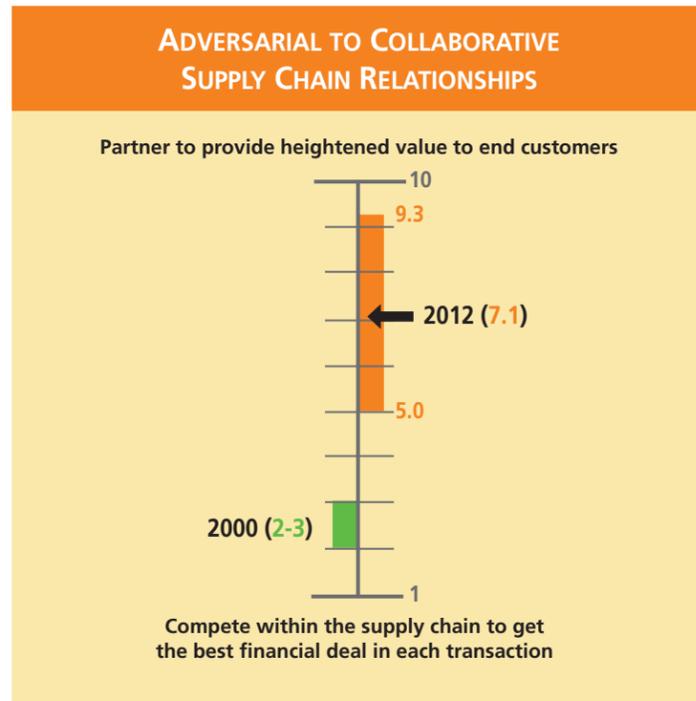
CASE EXAMPLE

A CONSUMER PACKAGED GOODS FIRM recently started focusing on choice retail customers and partnering with key customers to develop a more strategic view about how the business should progress. The company is now involved in joint business planning with its top customers. This is a radical shift from the previous business model that focused on cost reduction, an approach that “made us order takers rather than demand creators,” said a senior manager. More importantly, the new approach has been coupled with the need to balance supply chain capacity with the desired demand that is being created. This change has come from the highest leadership in the organization and is a significant cultural change for the organization’s managers and employees. To embed the new approach into the organizational culture, a balanced scorecard has been adapted to include common metrics across all functional areas and support the new customer focus on relevant value. The company is in mid-transition but has a strong framework that is guiding decisions throughout the organization. Financial results are beginning to suggest the success of their new business approach.

ADVERSARIAL TO COLLABORATIVE RELATIONSHIPS

BY CHAD AUTRY, Ph.D.

Taylor Professor of Supply Chain Management



WHY IS THIS A GAME-CHANGING TREND?

Developing collaborative relationships with suppliers and customers is a game changer because so few firms really accomplish true win-win partnerships. But the few that do have experienced dramatic and even breakthrough improvements in product availability, cash flow, cost, and shareholder value. Supply chain professionals have been talking about collaboration for years, but unfortunately, as one executive lamented, “When all is said and done, there’s been more said than done.” Companies can achieve game-changing competitive advantage in this area by accomplishing what their competitors have failed to do.

For example, in the book *The New Supply Chain Agenda* we discuss in detail a win-win collaborative relationship between OfficeMax and their supplier Avery Dennison. The collaboration results were spectacular:

- In-stock fill rates rose from about 90% to 99% plus
- Lead times reduced by 60%

- Forecast accuracy improved by 30%
- Inventory turnover increased 9%

And beyond just the numbers, the two companies could focus on driving growth rather than confrontation and firefighting.

ENCOURAGING EVIDENCE OF COLLABORATION

Outstanding examples of collaboration have finally begun to emerge. What will it take to get to the next level in collaborating with partners? Before answering that, let’s reflect for a moment on the progress made.

The 2000 study referenced above noted that many firm-to-firm supply chain relationships were problematic. The relationships were characterized by an overall lack of trust between the parties, limited or sporadic information sharing across the organizational interface, and the pursuit of short-term, firm-specific benefits at the expense of partners’ economic interests. To measure the effectiveness of a firm’s collaboration, the original study used a 10-point scale. A score of 1 signified overt competition or hostility with a lack of constructive relational behavior between the “collaborators”; a score of 10 indicated full-scale partnering with focused activities and reciprocal accountability for reaching collaboration outcomes. At that time, overall supply chain collaboration across industries averaged between a 2 and 3. Prospects for successful supply chain integration were bleak because the average relationship was adversarial and firms were more likely to offer lip service rather than actually practice collaboration. But the authors predicted that by 2010 a typical collaboration across industries would score much higher. The current (2012) data collection confirms that prediction. Firms across industries range between 5 and 9.3; they average 7.1 on the same scale. This increase offers encouraging evidence that contemporary firms are using collaboration to reduce work duplication and redundancy, streamline work flows and processes, and communicate better around shared objectives.

Two companies together can clearly provide new value that can’t be provided by either company in isolation.

A THREE PART BEST PRACTICE MODEL

Still, progress toward strategic collaboration within supply chain relationships has proven difficult for many companies, particularly if it requires changes to organizational culture and structure. If firms can improve on a limited set of identified behavioral drivers, collaborative behavior could potentially be leveraged further with significant impact.

Many of the issues that caused some CPFR (collaborative, planning, forecasting, and replenishment) implementations to fail are still with us today. Future collaboration can successfully avoid these traditional challenges by using data analytics to improve service and grow revenue, to cut joint stocks to reduce capital investment and carrying costs, and to improve overall margins.

Our best practice model indicates three initial drivers to facilitate a move toward better collaborative relationships. First, both parties need to address collaboration’s potentially negative aspects. Procedures should be established early to resolve potential disputes, unforeseen issues, and the potential dissolution of a dysfunctional or no longer useful relationship. Second, to share risks and rewards, both parties must develop supporting organizational and inter-organizational structures. This includes work rules, leadership roles, and guidelines that both parties will follow about how responsibilities, risks, and rewards will be shared. Third, mutual trust must be encouraged for strategic and operational integration. This includes establishing shared values and vision. In that shared vision, both must prioritize long-term viability to serve the end customer even when that requires a sacrifice of optimal short-term results. Considered together, these three groupings of relational aspects are critical to the success of collaborative ventures across businesses. Over the last decade they helped move collaboration beyond that initial low score.

**SUPPLY CHAIN COLLABORATION—
ADDITIONAL KEY SUCCESS FACTORS**

As the discipline of supply chain management has evolved over the past decade, three more specific drivers have emerged. Collaboration commitment, goal congruency, and integrated information sharing have been identified as critically important. Each of these success factors is explained below with current examples to depict best practices. By focusing on these drivers, businesses can develop superior connections with key partners. That ultimately leads to a competitive advantage with greater efficiencies and market effectiveness.

Collaboration Commitment

For collaboration between two supply chain firms to succeed, mutual trust remains essential. However, simply trusting the partner to act as expected is risky. External forces, internal interests, or a lack of commitment to the venture may disrupt the best collaborative intentions. A senior manager may be unwilling to underwrite a project even though the day-to-day participants are heavily invested. Inadvertently or purposefully, firms can violate the agreement.

For example, in the mid-2000's Procter & Gamble initiated an automatic inventory replenishment project with Kmart stores to reduce the total cost for selling baby products. At the time, those products represented a critical source of profitability for P&G. P&G invested significantly in the program. However, Kmart managers never really bought into the project. They believed it was too tactical to yield major transformation, so after an only marginally successful early experience, their attention to the project waned. With Kmart's low expectations, the collaborative venture underperformed. But P&G learned from the experience and established successful inventory replenishment arrangements with Walmart later.

In a nutshell, firms can no longer simply create procedures for disagreements; they must also define social or financial costs for violating the agreements. These costs disrupt

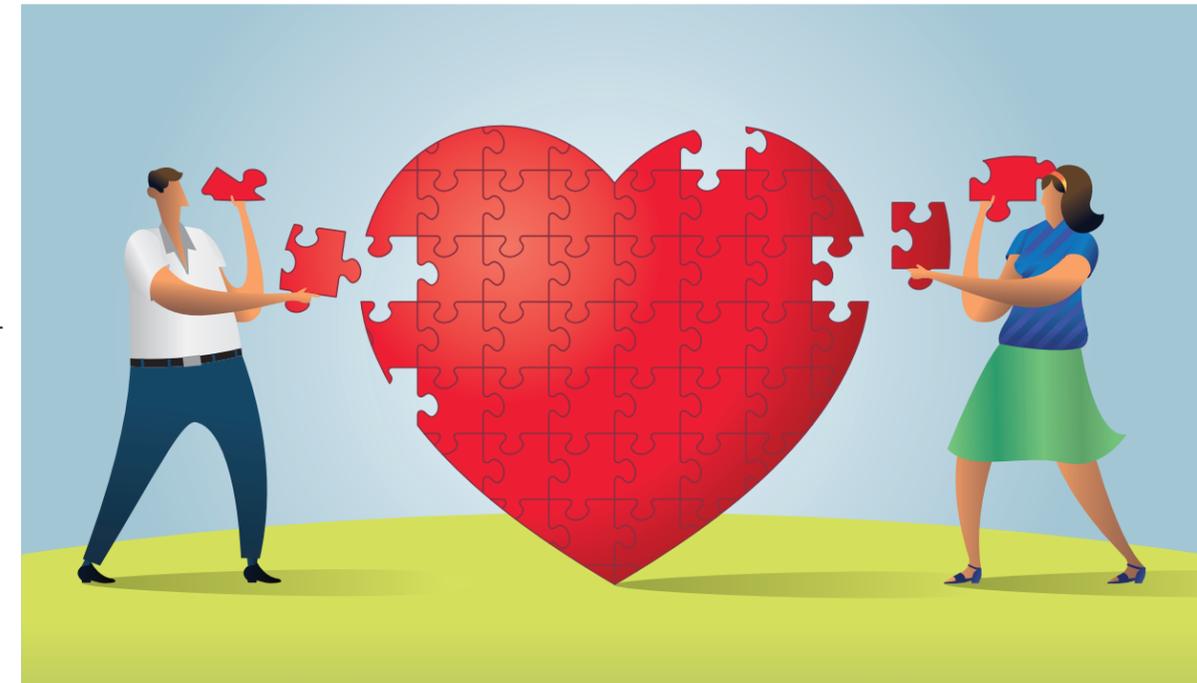
relationship-damaging behavior and reduce failure risk. When both sides see each other as having some "skin in the game," each can more readily justify resource expenditure toward the common goal. If early in the collaboration period P&G and Kmart had developed a mutual understanding of goals and then established performance metrics that adequately incented each party to participate, the replenishment venture would have had a better chance of succeeding.

Goal Congruency

Rather than simply establish shared values and visions, collaborating parties need to share desired outcomes as well. Establishing common goals appears to be a relatively straightforward task, but the "devil is in the details." Sometimes one side assumes performance specifics that are not covered by the formal agreement. Or the collaborating parties establish common goals but prioritize them differently. One party's goals may change as the collaboration develops, but the other wishes to stick with the original agreement until the venture is complete. In each of these instances the parties disagree about the desired collaboration outcomes. That lack of alignment can lead managers to adopt a "what's in it for me" orientation toward the collaboration. Then the desired collective outcomes suffer.

On the other hand, clear goal and outcome congruency clearly leads to mutual benefits. When DuPont Chemical sought to become a more sustainable company in the late 2000's, its collaborative venture with Exel Logistics began with several meetings designed to create goal congruency and define the "mutual win" space. At these meetings, senior executives from both companies openly discussed the best way to significantly reduce DuPont's 81 million pound annual landfill volume. With a deep understanding of DuPont's ambitions, Exel crafted solutions such as composting, reutilization, and waste-to-energy. These reduced landfill volume more than 20% and reduced CO2 emissions by nearly a million metric tons within five years.

FIRMS ARE ESTABLISHING FEWER ADVERSARIAL AND MORE COLLABORATIVE RELATIONSHIPS.



Integrated Information Sharing

Rather than simply create generally supportive organizational and inter-organizational structures, collaborating firms need to integrate technology to share real-time information. The value of firm-to-firm information sharing in facilitating supply chain integration is well established. As technology has become easier to acquire and develop, it has become a necessary but insufficient criterion for supply chain success. Accessing technology does not necessarily create value. Partners must analyze the data for opportunities and threats to shared goals; then they can pre-emptively solve problems. An information sharing culture must be developed to support the technology. A venture is likely to underperform if users on both (all) sides are unwilling to enable openness and transparency via the selected technological solution.

If an information sharing culture can be developed, collaboration capabilities and benefits are likely to increase. For example, when a key supplier for road construction firms recognized significantly greater demand for its materials along with pressure to better execute on-time, low-cost deliveries, it sought

a collaborative solution. The supplier collaborated with a leading technology provider and a long-haul carrier. Together they customized a transportation management system to minimize road miles (and therefore fuel expenditures) while also minimizing how many underpasses and narrow-laned and/or urban roads would be used. The solution worked because the customer firms were willing to estimate job times and locations well in advance. They also shared their forecasts for material requirements. Collectively they created a mutually beneficial venture.

SUMMARY

Firms are establishing fewer adversarial and more collaborative relationships than they were a decade ago. The climate has changed, but the adversarial overtones that have characterized many supply chain collaborations will never entirely disappear. By considering collaboration commitment, goal congruency, and integrated information sharing, along with earlier identified success factors, firms can develop mutually beneficial long term performance outcomes more quickly.

INCREMENTAL CHANGE TO A TRANSFORMATIONAL AGILE STRATEGY

BY JOHN BELL, Ph.D., and
DAVID GILGOR, Ph.D
Assistant Professor, University of Missouri, Kansas City



WHY IS THIS A GAME-CHANGING TREND?

Our research shows that only 16% of firms have a documented, multi-year supply chain strategy at all...let alone an agile, transformational strategy. Yet the supply chain is the heartbeat of the firm, the prime driver of economic profit and shareholder value. Firms clearly must have a strategy to achieve a game-changing supply chain.

For example, in the Harvard Business Review article *Leading a Supply Chain Turnaround* the authors discussed the story of how Whirlpool implemented an agile, transformational strategy. The strategy served as the foundation for a true supply chain transformation and led to the following breakthrough results achieved by Whirlpool:

- Historic low inventory level, down almost \$100 million
- Record high service levels
- Total cost down over \$20M, ignoring inflation
- A major customer satisfaction improvement, with typical customer survey responses being

- “Whirlpool is most improved”
- “Whirlpool is easiest to do business with”
- “Whirlpool is most progressive”
- “Whirlpool is good now, but more importantly, they are consistently good.”

MOST FIRMS LACK AN AGILE TRANSFORMATIONAL STRATEGY

As noted, our research shows that even though progress has been made, few firms have an agile transformational supply chain strategy. What will it take to get to the next level in creating agile transformational supply chain strategies? Before answering that, let's reflect for a moment on the progress made. In the landmark 2000 study, researchers optimistically predicted that firms would move from an environment dependent on experience and incremental change to a transformational strategy capable of adapting to unprecedented competitive changes. And our survey results do reveal some movement in that direction.

Back in 2000, many felt that the uncertainty and continuous change in the competitive and rapidly emerging global marketplace would force firms to rely dramatically less on historical processes and strategies. They predicted that 21st century firms would need to continually reinvent processes with decision-making capabilities to quickly and flexibly adapt to unexpected environmental changes. Agility would be the order of the day. Firms would have to learn how to manage in “uncharted waters,” to recognize that previously successful actions may not be effective in new conditions.

THREE ACTIVITIES NEEDED TO BE MORE ADAPTIVE AND AGILE

In 2000, researchers noted that to develop more adaptive and agile transformational strategies, firms would need to take three actions:

1. Identify and document an expanded total landed cost-to-serve as a framework based on multiple scenarios and not limited to historical solutions
2. Develop business analytics and modeling skills for situations outside the norms of current business

3. Build better expertise in the application of decision support and IT tools to identify patterns, assess potential performance, and manage newly developed processes.

Progress has been made in each of these dimensions, but two important concepts could help firms move more rapidly to a transformational strategy. First, the development of “agile” supply chain strategies requires the proactive and adaptive mechanisms needed to respond to unprecedented marketplace changes. Second, building and executing an agile strategy requires a management team with the right mix of talent and decision-making skill sets to navigate a firm through uncertain times.

The remainder of this section focuses on several concepts which will help firms move further toward achieving a score of 10 in this megatrend.

THE ESSENCE OF AGILE STRATEGIES

Agile strategies recognize that individual businesses no longer compete as solely autonomous entities but rather as supply chains. To achieve a competitive advantage in the rapidly changing business environment, firms must coordinate operations with suppliers and customers to achieve a level of agility beyond that of competitors. Supply chain members must be able to rapidly align collective capabilities to respond to changes in demand and supply.

Agility is a broad concept that can be defined as the firm's ability to quickly adjust tactics and operations within its supply chain to respond or adapt to changes, opportunities, or threats in its environment. New research being conducted at the University of Tennessee (UT) indicates that supply chain agility possesses five distinct dimensions: alertness, accessibility, decisiveness, swiftness, and flexibility. Many of these dimensions are analogous with sports medicine's concept of agility as applied to world-class athletes and the military's perspective on agility as applied to fighter pilots. The following sections describe each of the five dimensions.

Alertness

Alertness is the first dimension of firm supply chain agility, and it can be described as the firm's ability to quickly detect changes, opportunities, and threats. This dimension suggests that firms must recognize changes before they can respond to them. Within sports science, research has shown that a



player's ability to execute tasks is dependent upon factors such as visual-scanning techniques, visual-scanning speed, visual processing, perception, and anticipation. These factors are reflected in a players' on-field agility.

Elite performers differ from non-elite performers in their ability to anticipate the

opponents' movements. In military science, researchers refer to the alertness capability as situational awareness, the perception of environmental elements with respect to time and space. Military forces in combat require early awareness of potential threats, and the more quickly environmental changes are detected, the sooner a response can be deployed.

Similarly, agility in a supply chain setting requires that firms be sensitive to external markets (including competitors, customers, and suppliers) and their customers' changing requirements. A firm must be able to identify shifts in market trends, supplier capabilities, competitors' actions, and even government policy and regulations. Highly effective organizations capable of transition strategies remain alert to change and can successfully predict competitors' actions.

Accessibility

Accessibility emerged as the second dimension of firm supply chain agility and is described as the ability to access relevant data. UT research suggests that once a change is detected, a firm must also be able to access relevant data to decide how to respond. Supply chain-wide information access is a key requirement for supply chain agility. This implies that agile supply chains must be virtual; that is, they must be information-based rather than inventory-based. Supply chain members must share real-time demand, inventory, and production information to build a more transitional strategy.

In military science, the ability to orient the combat unit to the situation and determine potential courses of action is critical. In the military, these capabilities reside in the intelligence and communications functions. Similarly, for competitive firms the creation of a virtually connected supply chain allows individual supply chain members to access and communicate relevant data in real-time and then make informed decisions about how to respond to detected environmental changes.

Decisiveness

Decisiveness is the third dimension of supply chain agility and can be described as using



the available information to make decisions resolutely. High performance in sports is ultimately determined by effective decision-making skills. Offensive players who demonstrate proficient agility employ superior decision-making skills in response to the movements of their opponents; as the complexity of the task increases, decision-making skills become even more important.

Similarly, firms must create processes to sort through available information and make resolute decisions on how to respond to supply chain changes. They cannot solely rely on historical experience, which may no longer be relevant. Processes such as Sales and Operations Planning help provide a forum for resolute decision-making that utilizes the best available information in demand and supply markets.

The alertness, accessibility, and decisiveness dimensions of agility emerge through coordination and planning processes that enable firms to determine appropriate responses to opportunities or threats. Agile coordination and planning processes are necessary, but they are not everything required for supply chain agility. A firm must also be able to act on agile decisions. Swiftens and flexibility are the capabilities that firms use to implement agile decisions.

Swiftens

The fourth dimension of agility, swiftens, is defined as the ability to implement decisions quickly. Sports and military science identify swiftens as an essential component of agility. In both, the speed of movement and a change of direction speed (or action) are required to respond agilely.

Similarly, to achieve the desired level of supply chain agility, firms must develop the ability to complete an activity as quickly as possible. For example, within manufacturing, the ability to carry out tasks and operations in the shortest possible time has been considered a necessary condition for agility.

Flexibility

Flexibility is defined as the ability to modify

the range of tactics and operations to the extent needed. In a sports context, an athlete's mobility of joints (i.e., flexibility) controls the range of quick adjustments an athlete can perform. The type of directional change (agility) performed depends on the flexibility of the specific body parts involved in the exercise. If an athlete exceeds his range of flexibility when attempting to perform a maneuver, injury is likely to occur.

Sports science research indicates that agile performance can be improved through flexibility training. Military science research also recognizes that built-in flexibility is needed for agile military response. In the same way, a firm's supply chain operates within a specific range, and the firm's supply chain agility (i.e., adjustment of tactics and operations) will be constrained by that range. For example, the firm's supply chain cannot quickly produce more items than its fixed manufacturing capacity allows. Therefore, a firm's response to changes depends on the flexibility of its supply chain tactics and operations.

AGILITY IN PRACTICE

Together the five distinct dimensions of agility (alertness, accessibility, decisiveness, swiftens, and flexibility) allow firms to rapidly respond to a volatile and ever-changing marketplace. According to research sponsor Ernst & Young, many of today's leading firms are attempting to achieve these agile capabilities by adopting innovative practices that include benchmarking, purchasing intellectual property rights, or even acquiring smaller start-up firms to extend their capabilities.

Similarly, research sponsor Terra Technology has indicated that agile capabilities are no longer just about using internal decision support systems, as indicated in the original research study. Today, firms need the ability to automatically collect, analyze, and make daily decisions based on large volumes of external data. Demand sensing technologies and decision algorithms with artificial intelligence capabilities now allow firms to adapt in an agile manner.



According to Terra Technology, this means having seamless automatic software capabilities that can retrieve retail point-of-sale information on a daily basis. In this manner, agile responses include knowing what’s going on *and* knowing what to do about it. Research and experience indicate that as firms move to more transition oriented strategies, agile capabilities will be critical to achieve future marketplace advantages.

AN AGILE WORKFORCE IS CRITICAL

Today, building an experienced workforce that is trained only on historical standards and processes is clearly not the right approach. Instead, recruiting and sustaining a labor force with keen decision-making skills appears to be critical for achieving an agile transition strategy that executes the five dimensions of agility. Firms will need managers with improved planning capabilities and state of the art analytical skills to match an increasingly volatile supply chain environment.

According to Ernst & Young, competitive firms in today’s dynamic business need a “people

agenda,” that builds the right mix of talents within their firm. Additionally, firms must also understand how intellectual property and knowledge-based capabilities help them be more agile. According to E&Y, many of today’s large, world-class corporations are studying and seeking to acquire the more agile decision-making skills possessed by smaller innovative businesses. The ability to rapidly rebuild structures and implement innovative solutions depends on the intellectual competencies possessed by a firm’s leaders and workforce. Creating such capabilities can make a firm more agile and more competitive.

SUMMARY

Over the last decade firms have moved significantly toward agile transitional strategies; they are much less dependent on experience-based strategies. However, by understanding and improving their supply chain agility dimensions, firms may continue to advance in this megatrend. Recruiting and developing talented employees with the decision-making skills needed in an agile environment remains critical for maturing in this area.

TO ACHIEVE THE DESIRED LEVEL OF SUPPLY CHAIN AGILITY, FIRMS MUST DEVELOP THE ABILITY TO COMPLETE AN ACTIVITY AS QUICKLY AS POSSIBLE.



FUNCTIONAL FOCUS TO PROCESS INTEGRATION

Cross-Functional Integration: Purchasing Through Logistics

BY KEN PETERSEN, Ph.D.
John H. Dove Professor of Supply Chain Management

WHY IS THIS A GAME-CHANGING TREND?

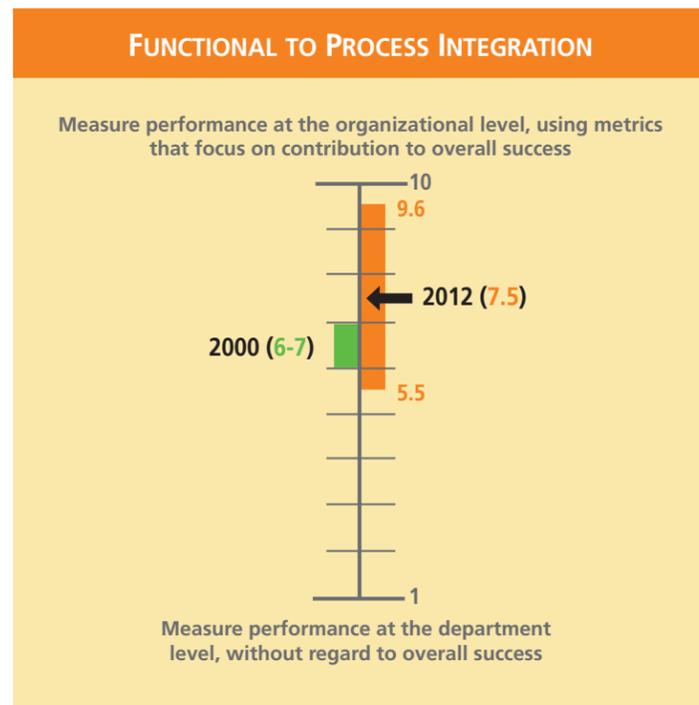
Over the past five years, we have interviewed over 700 supply chain professionals during supply chain audits. Based on all of those interviews, we are absolutely confident that supply chain professionals recognize true cross-functional integration as a game-changing trend. In fact, when we ask the “wish list” question in our interviews, supply chain professionals don’t ask for more resources but instead pine for a company where the silo walls have come down. They intuitively know that this lack of cross-functional integration is a huge issue holding them back.

Oliver Wight International has documented the power of cross-functional integration in their work in IBP (integrated business planning). In our Supply Chain Forum, they shared the following results for the cross-functional collaboration’s best performers.

Area	Percent reporting improvement	Percent improvement
Forecast accuracy	43%	18-25%
Asset utilization	39%	
Customer satisfaction	39%	
Inventory reduction	37%	18-46%
Fill rate	34%	10-50%
Revenue increase	31%	10-15%
Working capital	30%	
Perfect order	30%	
ROA	30%	
Gross margin	29%	
Cost reduction	29%	30-45%

DEEP CROSS-FUNCTIONAL INTEGRATION IS STILL A MAJOR CHALLENGE

Most supply chain professionals would agree that cross-functional integration is an absolute requirement for supply chain maturity. Unfortunately, most would also acknowledge that they are well short of this goal. What will it take to get to the next level in cross-functional integration? Before answering that, let’s reflect for a moment on the progress made.



In 2000, firms reported that they had achieved a level of 6–7 on a 10-point scale of functional orientation (1) to process integration (10). Today, firms are reporting that they have achieved an average level of 7.5, with a range of responses between 5.5 and 9.6. However, even though the figure above suggests that firms are both improving and achieving relatively higher levels of process integration, it is doubtful that they are really achieving the type of deep cross-functional integration that is the focus of this chapter.

WHY COMPANIES NEED TO CHANGE

Companies must engage seriously in this area for four key reasons:

1. Volatility is the new norm.
2. Segmented supply chains are necessary to handle the differences (e.g. between how you manage high volume–low variability products vs. low volume–high variability products or small highly profitable customers vs. large not so profitable customers).
3. Agility and responsiveness are necessary to capture margins and/or profitable growth.
4. Erosion of traditional competitive advantages such as changing cost structures (low cost manufacturing is no longer low cost).

Companies need to focus on the next generation of cross-functional integration. This will involve a move from the traditional view—sales/marketing plus supply chain (design-plan-buy-make-move) integration to the progressive view—sales/marketing plus supply chain (design-plan-buy-make-move) plus finance plus legal/regulatory plus order fulfillment/customer service. This will depend on:

- Cross-functional participation in decision-making
- Shared information/data visibility & transparency
- Total cost/margin optimization vs. functional cost optimization
- The ability to
 - Assess tradeoffs holistically
 - Respond to each value chain segment
 - Manage profitability through the product and customer lifecycle

THE CHALLENGE: BUSINESS-WIDE CROSS-FUNCTIONAL INTEGRATION

Cross-functional integration is perhaps one of the most challenging opportunities for businesses today. Often a business will

consider upstream integration with its supply base or downstream integration with its customer base to be its most central integration problem. However, we believe that the largest integration problem is cross-functional and exists within the four walls of the business. In fact, this problem causes internal business functions to compete with each other, which reduces the ability to deliver customer value and perhaps even destroys customer and shareholder value. Cross-functional integration presents a difficult problem for a number of reasons. Some of these reasons include (1) the firm’s operating model, (2) metrics, (3) alignment with supply chain, (4) culture, (5) and tools. Each of these enablers/barriers will be discussed below:

- **Operating Model**—Traditionally, firms have organized to deliver customer value by developing functionally specific organizational designs. From the perspective of overall business process improvement and customer value creation, this focus on the function has fostered excellence within function, but has not yielded excellence in the connection of functions.
- **Metrics Alignment**—Often metrics tend to drive functional performance, but they are disconnected from cross-functional performance. For example, the purchasing function may seek to reduce per unit raw material cost with longer lead times and larger lot sizes while the manufacturing and planning functions seek to create more agile and responsive operations with smaller lot sizes and reduced finished goods inventory. Given the cross-functional nature of supply chain business processes, these functionally oriented metrics can drive functions to conflict and/or compete with one another.
- **Supply Chain Strategy Alignment**—The supply chain strategy is often not aligned with a firm’s core competencies or strategy to compete. This results in a less than ideal collaboration within the supply chain functions as well as with other business functions. The supply chain strategy must enable corporate business strategy. For instance, the purchasing function may well be driven by a

functional strategy that is not informed nor understood by other functions within the business.

- **Culture**—Frequently businesses have not invested in developing a deep culture of cross-functional collaboration. Of course, cross-functional business processes tend to be better supported by a culture of cross-functional integration in some areas. An example of one of these business processes is Sales and Operations Planning (S&OP). However, the state of “cross-functional culture” in businesses is generally poor. Interestingly, when asked, most business leaders will state that their businesses are very mature at cross-functional integration. This misalignment between perception and reality tends to hinder the development of a healthy cross-functional culture.
- **Tools**—The business tools for important processes simply don’t support cross-functional integration and involvement. For example, many corporations run their supply chains from Excel spreadsheets rather than through integrated planning and execution systems. This lack of tools and information technology systems that facilitate collaboration results in inefficient manual processes. Valuable resources are spent to gather and crunch data rather than analyzing, evaluating options, and making decisions.

In summary, we believe that cross-functional integration is a problem that exists across the business and all of its important functions. Further, without healthy cross-functional collaboration, establishing an efficient end-to-end supply chain with trading partners such as customers and suppliers is much more difficult. To reiterate this point, business leaders must first create strong and robust cross-functional integration within their firm. Only then will their business have the opportunity to reach its integration potential with upstream suppliers and downstream customers.

AN UNRECOGNIZED PROBLEM: PURCHASING AND LOGISTICS INTEGRATION

Next, we will consider cross-functional integration between the purchasing and logistics



CROSS-FUNCTIONAL
INTEGRATION
IS AN ABSOLUTE
REQUIREMENT FOR
SUPPLY CHAIN
MATURITY.

functions. This is a problem that often flies under the radar in most firms. The lack of integration between these two traditional supply chain functions is surprising, and it can be quite damaging to the firm. The focus of the cross-functional integration problem is often between operations/supply chain and sales/marketing. Yet the opportunity for integration within the supply chain area, and in particular between purchasing and logistics, is huge.

THE FALLACY OF SUPPLY CHAIN INTEGRATION BETWEEN PURCHASING AND LOGISTICS

From the perspective of either the purchasing area or the logistics function, each of their functional strategies is very closely aligned with the higher order business strategy that they intend to support. However, when you examine the two functional strategies together, the overall alignment between purchasing and logistics is poor. In many cases, it contributes to the destruction of customer value and to an increased total cost of ownership for the firm. To achieve integration within the supply chain areas, two broad principles should be followed: supply chain orientation and purchasing to logistics integration.

Supply Chain Orientation

The broad supply chain organization must appropriately develop, manage and improve supply chain strategies that drive from a common “executive” orientation. This “executive” orientation should focus in a number of areas, but should not have a functional focus. Some critical areas of orientation include (1) relevant value focus, (2) strategic resource allocation, (3) knowledge management, (4) change management, (5) risk management, (6) innovation and transformation, (7) continuous improvement, (8) market orientation, and (9) long-term orientation. This executive orientation provides the platform on which integrated purchasing and logistics processes may be appropriately developed to leverage customer value and total cost of ownership (TCO).

A Focus on Purchasing to Logistics Integration

For supply chain to appropriately support business strategy, a change in how supply chain functions undertake their business processes is required. That is, firms must remove the organizationally convenient but

artificial functional silos: purchasing, planning, manufacturing/operations, and logistics. Then the underlying integrated business process around supply chain management may function properly.

HOW TO INTEGRATE PURCHASING AND LOGISTICS: EIGHT STEPS

The following is a discussion of some of the strategic process areas that may provide the greatest opportunity to improve integration of the critical but less-integrated supply chain functions: purchasing and logistics. These strategies are driven by the “executive orientation” described above and produce the “performance-targeted” outcomes discussed in the following section.

- 1. Strategic Approach**—The purchasing and logistics functions should co-develop all or parts of their respective functional strategies. In doing so, each function will have greater visibility into the drivers and processes of the other function. This visibility will create an opportunity to remove competing processes and objectives.
- 2. Measurement Design**—The performance measurement systems within both purchasing and logistics should be appropriately comingled. For instance, to drive towards improved alignment between the functions, purchasing should be co-tasked with logistics performance metrics and logistics should be co-tasked with purchasing performance metrics. This falls under the old adage of “what is measured is what will be valued.”
- 3. Organizational Design**—An examination of the organizational structure of purchasing, logistics, and any overarching supply chain function should be examined for opportunities to create improved integration. In many firms, the logistics function and the purchasing function do not report to a common “supply chain” executive. Without an organizational design that supports integrated processes and capitalizes on opportunities from this functional integration, benefitting from the alignment of purchasing and logistics will be difficult.
- 4. Partner Selection**—Jointly choosing suppliers and logistics service providers may well provide insight that could be leveraged into improved customer value and improved total cost of ownership. The choices have implications across the supply chain functions that are important to delivering customer value.
- 5. Partner Development**—Once a partner selection decision has been made, certain partners will overperform, others will perform as expected, while still others will underperform. There may be an opportunity to invest in “partner development” with underperforming partners. Given that a firm typically has relatively limited resources for partner development, considering both supply partners as well as logistics partners simultaneously allows for the most effective use of these limited resources. Further, the development of a logistics partner or supply partner may be done more effectively in some cases with a joint purchasing/logistics approach.
- 6. New Product Development**—Developing products that deliver the greatest value to a firm’s immediate customer and the ultimate consumer may be done most effectively when both the supply base and the logistics supplier base is leveraged in areas where these partners hold core competencies. In other words, a purchasing/logistics-integrated product/process/service design can be better targeted at the desired value of the ultimate consumer.
- 7. Global Supply Chain Management**—The implications for cross-functional integration between purchasing and logistics are paramount when considering the global nature of consumers, logistics systems, and the location of supplier partners. Designing this global supply chain to deliver the best customer value and lowest total cost of ownership can only be effectively accomplished by jointly considering both the logistics system and the characteristics/location of existing and potential suppliers.
- 8. Supply Chain Security**—Increasingly, firms have felt the negative effects of risky/unex-

pected events that occur in the form of natural disasters, supplier failure, terrorism, etc. Designing a robust supply chain should necessarily include, among others, the purchasing and logistics functions. However, the purchasing and logistics functions must examine the issue of supply chain security together. Only together can a supply chain design be developed that appropriately understands, prevents, and or mitigates the risk of supply chain disruption.

THE BENEFITS OF INTEGRATING PURCHASING AND LOGISTICS

Ultimately, purchasing and logistics can work together and work with manufacturing and planning to create supply chains that deliver breakthrough performance to both the firm and stakeholders. Specifically, this performance may come in the form of (1) customer satisfaction, (2) cost/price, (3) total cost of ownership, (4) quality, (5) cycle times, (6) delivery, (7) responsiveness, (8) flexibility, (9) innovation, (10) environmental and social sustainability, (11) compliance, and (12) the development, enhancement, and protection of intellectual property.

This “performance-targeted” supply chain design is accomplished by leveraging the strategies discussed above, which are driven by an appropriate executive orientation. Certain enablers may need to be present for this “executive orientation” to “supply chain strategy” to “performance-targeted supply chain design” to properly function.

ENABLERS OF CROSS-FUNCTIONAL INTEGRATION

In order for an executive orientation to drive appropriate integrated purchasing and logistics strategies, certain enablers may well be needed. Some of these enablers may include (1) an understanding of the global environment, (2) an understanding on the part of supply chain functional leadership of both the finance and accounting functions in the

language associated with these functions, (3) an understanding on the part of supply chain functional leadership of the marketing function, (4) a focus on acquiring, developing, retaining, and off-boarding supply chain talent, (5) an understanding of cross-functional teaming, (6) an understanding of information systems and technology, and (7) an understanding of supply chain analytics.

SUMMARY

This chapter presents our view of the current state of cross-functional integration and articulates a number of important drivers for successful cross-functional integration. This chapter also develops the importance of the specific case of cross-functional integration between the purchasing and logistics functions. We believe that for too long these supply chain functions have been strategically aligned with their functional strategies and compete with each other. That misalignment leads to the destruction of customer value and reduced firm performance.

While from a process perspective (plan-source-make-deliver) these functions are separated by the “value creation” function (planning, manufacturing, service provision, etc.), from an overarching process perspective they are extremely integrated. In fact, they are so highly related that managing them in functional silos is one of the largest factors leading to disintegrated supply chains. Supply chain executives should turn their supply chain integration focus inwards. While the “great divide” was once described as the chasm that existed between marketing/sales and manufacturing/operations, the new “great divide” is between purchasing and logistics. Firms that strive to close this chasm will outperform those that do not. The writing is on the wall.¹

¹This chapter represents a brief overview of the PuLL (Purchasing & Logistics Leadership) initiative at the University of Tennessee.



GAME CHANGER

A key, a kite, a rainstorm—and the world was never the same. What has more profoundly changed the way man lives? From how we illuminate our homes, store and prepare our food, to how we communicate and conduct commerce, electricity touches our lives in thousands of ways.

ABSOLUTE VALUE FOR THE FIRM TO RELATIVE VALUE FOR CUSTOMERS (World-Class Metrics)

BY PAUL DITTMANN, Ph.D.
Executive Director, The Global Supply Chain Institute

WHY IS THIS A GAME-CHANGING TREND?

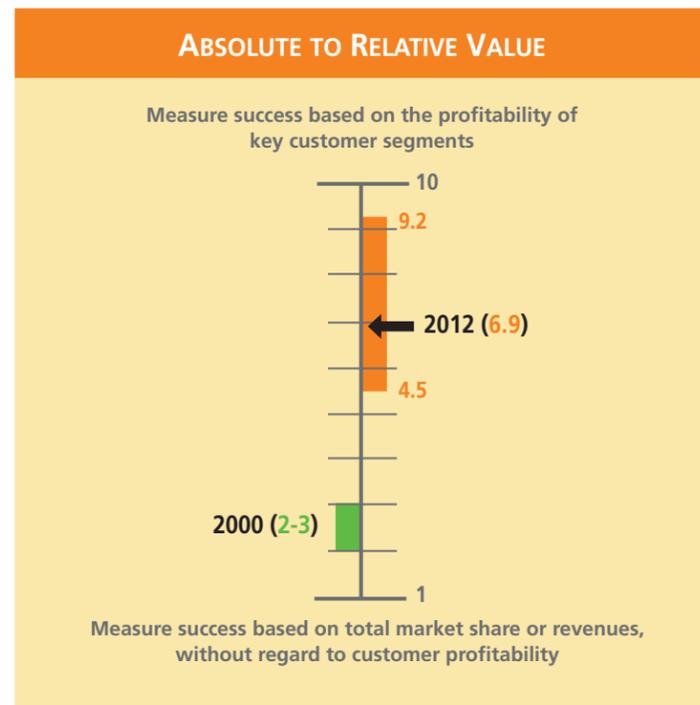
Can simply changing the performance measurement and goal setting system inside a firm significantly enhance the overall performance of the supply chain? You bet it can. Just as firms need a transformational supply chain strategy, they need a metrics and goal setting system that drives the new behaviors required by the new strategy. The old phrase is still apt: “If you always do what you always did, you’ll always get what you always got.” We need a new metrics/goal setting system aligned with a transformational strategy to change the supply chain game.

For example, a large consumer packaged goods company felt they needed something that would break through the firm’s complacency, something that would propel them to a new level of performance. They developed the perfect order metric, calculated by multiplying together four factors for each customer order: on-time, complete, damage free, and invoiced correctly. Instead of basking in the glow of 95% performance in each category, they were stunned to see a new metric that showed an 81% level of performance (e.g. 0.95 x 0.95 x 0.95 x 0.95). This drove the organization to a totally new level in customer service, caused their competitors to scramble, and significantly increased market share and sales.

SUPPLIER AND CUSTOMER-SEGMENTED METRICS CAN BE POWERFUL TOOLS

The subject of how to measure ourselves is always one of the most popular topics for our Supply Chain Forum members. Many supply chain professionals seem to be searching for the “magic bullet,” i.e., a set of key performance indicators (KPIs) that suddenly create a new higher level of performance. What will it take to get to the next level in supply chain metrics? Before answering that, let’s reflect for a moment on the progress made.

Our 2000 survey indicates that firms are looking at supply chain performance in a more sophisticated manner. For example, the data in the figure on page 26 shows a strong move toward performance assessment on a customer segmentation basis. The older survey indicted more of a focus on overall versus segmented customer measures. Of course, a segmentation approach can also benefit the supply side as well as the demand side. Supplier and customer-segmented metrics can be powerful tools.



Even though the above chart above shows encouraging progress, the 6.9 score is the lowest survey score among the 10 megatrends; therefore much improvement is still possible. In fact, we find that performance measurement in many firms is often labor intensive and inconsistent, held together with manual spreadsheets, decoupled from the strategy, and excessively detailed with a false sense of precision. As one executive said, "For us, it seems like death by a thousand metrics." Simple is better for metrics frameworks. Companies need a clear framework that can be translated to all levels of the organization with clarity for all employees.

From our data on hundreds of companies, we believe that best practices for designing a metrics framework exist. Before discussing those best practices, let's discuss why performance assessment is on the minds of supply chain professionals today. As your supply chain strategy evolves, many of you are asking, "what's new in the metrics world?"

MANDATE FOR NEW METRICS

What is new in the supply chain metrics world? In the 1980s we would have said,

"supplier scorecards." In the 1990's, we would have said, "balanced scorecards." Today, the "what's new" is the availability of masses of data from multiple sources, usefully organized in data warehouses to link outcomes with drivers and turn data into true insight.

Supply chain organizations and strategies must continue to evolve to meet the needs of rapidly changing customers, the challenge of aggressive competitors, and the inexorable advance of technology. This constant change demands a continual evaluation of existing metrics, if not a completely new set. Changing the organization and the strategy and then relying on the same tired set of metrics makes little sense. The right supply chain KPIs aligned with the right accountabilities to help the organization deal effectively with tradeoffs and proactively drive the right behaviors to support the supply chain strategy.

In a recent survey of our Supply Chain Forum members, we found that "choosing the right metrics" was rated third among 25 possible topics that supply chain professionals want to learn more about. Many supply chain executives thirst for a better metrics frame-

work. They worry that their existing KPIs prevent them from optimizing performance. They tell us that they want to

- Learn how excellence is achieved in similar companies
- Understand the drivers that most impact needed outcomes
- Set appropriate performance measures and targets for improvement
- Learn how others enable and empower employees to make change happen
- Understand how to create a culture of continuous improvement.

In another of our surveys, 34 business executives from a broad range of companies ranked the following supply chain issues on a scale of 1-10, with 10 the most important and 1 the least important. Performance measures and goal setting at No. 1 surprised us, but it shouldn't have.

Ranking of Supply Chain Executives' Interests	
Implementing the right metrics and setting the right goals	8.15
Establishing collaborative relationships with suppliers and customers	7.91
Advances in supply chain visibility	7.80
Professional development, training, education	6.71
Helping with revenue generation	6.62
Managing the global supply chain	6.55
Effectively using technology	5.21

Based on our database of hundreds of companies, we believe that best in class firms establish a metrics framework using four key principles, which are discussed in the remainder of this article:

1. Create the right cross-functional accountability
2. Establish a driver-based metrics framework
3. Set appropriate goals
4. Ensure that metrics cannot be easily gamed.

CREATE THE RIGHT CROSS-FUNCTIONAL ACCOUNTABILITY

Measuring something accomplishes little unless the right accountability is established.

Good supply chain leaders should always ask themselves if their metrics have been designed with the right cross-functional accountability in place. For example, the accountability for inventory, forecast accuracy, and product availability should be shared between the supply and the demand sides of the organization. One executive told us that only the production planning function had the goals for inventory turnover in their PPP (personal performance plan). Yet the planning function controlled neither the input to inventory (manufacturing) nor the output (sales). In this case, planning had all of the accountability and none of the control!

Unfortunately, this situation is all too common. There are few companies in which sales shares accountability for inventory. Yet sales' strategies tremendously influence inventory levels. This particular issue is one of the greatest organizational accountability flaws in firms today.

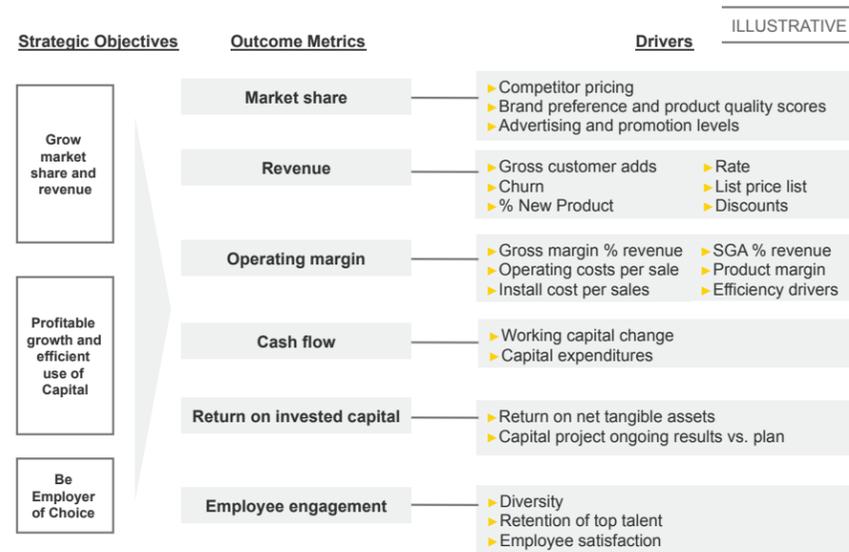
ESTABLISH A DRIVER-BASED METRICS FRAMEWORK

Are your metrics linked in a logical framework to your overarching goals, or are they simply a laundry list of items with no apparent logic? If the prime goal of the firm is to drive shareholder value, then a framework needs to be established so that the individuals in the organization can clearly see how every sub-metric flows into shareholder value.

We believe that the best practice is to first list your key outcomes and then identify the drivers of those outcomes. According to research sponsor Ernst & Young, leading companies use statistical correlational analysis to find the drivers that best link with the required outcomes. Ideally, they find drivers that have a disproportionately positive impact on the big outcomes needed. They then set up a hierarchical framework, or "driver tree," to visually show how each metric feeds overall goals, as shown in Figure 1 (example courtesy of Ernst & Young).

The expanding availability of data organized and linked in a data warehouse makes it

FIGURE 1. Performance management should tie strategy to measurable outcome metrics and the drivers behind those metrics



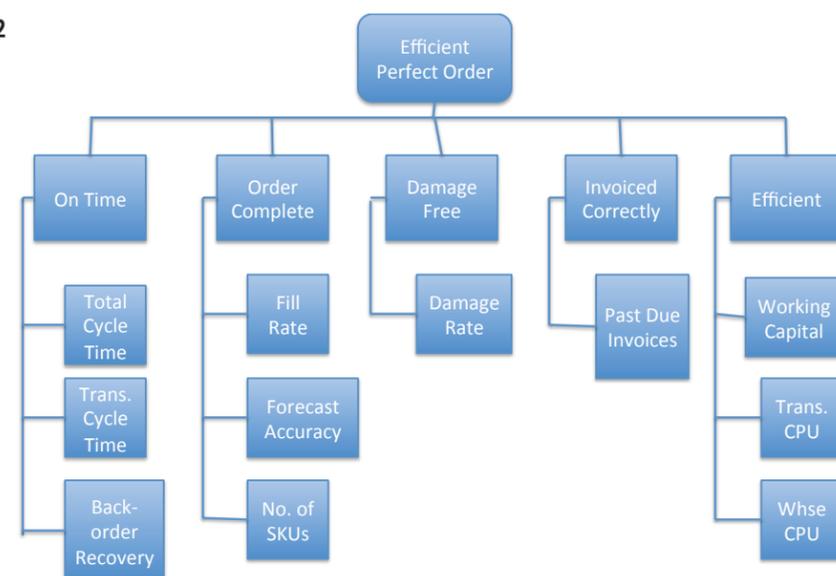
possible to find these correlations. In the future, data will be linked across the entire supply chain, from suppliers to customers. In the old days, companies were limited to data that existed within their four walls. Now it can be integrated across multiple parties in the value chain to measure the performance of extended supply chain.

In another example, a manufacturing firm we assessed selected “the efficient perfect order” as its ultimate goal. (The basic perfect order

performance as indicated above is calculated by multiplying together performance in four areas: on-time, complete, damage free, and invoiced correctly.)

The “efficient” perfect order in this firm then included cost and inventory as key additional factors. With the efficient perfect order as the overarching goal, this firm built a metrics driver-based framework, illustrated in Figure 2, to show how all of the sub-metrics contributed to achieving the perfect order.

FIGURE 2



THE PERFECT ORDER METRICS FRAMEWORK

A clear driver-based metric framework creates a common business language that leadership can leverage to align the organization toward common goals. One supply chain senior executive at a leading retailer consistently stresses the need for three outcomes in exactly the same order: product availability, inventory and cost. He wants all metrics focused on driving to world-class levels in each of these big three outcomes.

In developing the new metrics to support your strategy, make sure you have a driver-based framework with a set of criteria in place to avoid poorly designed or seriously flawed metrics. For example, we worked with one firm that defined a set of excellent criteria to design the new supply chain metrics needed to support its supply chain strategy. These characteristics became a hurdle test. Metrics had to reasonably satisfy the following criteria to be part of the KPI framework:

- Stable and accurate data with few, large, random, or unexplainable swings
- Understandable to everyone, along with a “line of sight” so that key personnel can see how their actions influence the metric
- Designed so that they cannot be easily manipulated or gamed
- Capable of drill-down analysis so that the root causes of changes are apparent
- Clear cause and effect drivers
- Easily accessible for relevant parties and available in clear reports that were developed and published with clear explanations.

These criteria always generated good discussion in the organization before a new metric was adopted. This resulted in a smaller number of high impact KPIs.

Finally, a firm’s supply chain metrics need to be supported by a disciplined and documented metrics governance process. Metrics governance is not a very exciting topic, but it

can be the most common and largest obstacle to execution. Companies need to define a consistent taxonomy, data standards, a driver library, and metrics definitions.

SET APPROPRIATE GOALS

Selecting the right metrics and defining the associated responsibilities is clearly important. Establishing goals is an entirely different matter. Too many companies only use internal comparisons (year over year performance, for instance) and feel good about achieving an internal goal. This “comparison of yourself to yourself” is a very dangerous practice. For example, one consumer product manufacturer achieved a 6.7 inventory turnover level on its finished goods inventory, a 15% improvement above the 5.8 level from the prior year. Unfortunately, when doing a competitive assessment, the company discovered that its major competitor had achieved an 8.5 inventory turnover level. The 15% improvement didn’t look so good in light of that statistic!

ENSURE THAT METRICS CANNOT BE EASILY GAMED

Many companies “game” their metrics. Supply chain professionals rationalize this data manipulation (e.g., “It would be unfair to include that SKU in our fill rate calculation; we’ve had supplier problems and can’t get enough of that product”), but in the end it only hurts the supply chain organization: it hides real performance and creates a disconnect between the company’s perception and the experience of the customer.

In a recent survey we conducted, 81% of respondents believe their company provides superior customer service. Yet only 8% of customers say they receive superior customer service. Likewise, in a recent analysis of our database, 94% of firms rated themselves above average in satisfying their customers. Since it’s statistically unlikely for 94% of companies to be above average, these respondents are either manipulating or overestimating their capability. Overestimation is more than just naïve; it actually destroys internal motivation because employees hear how well the



CASE EXAMPLE

A SUPPLY CHAIN VICE PRESIDENT IN A CONSUMER PACKAGE GOODS COMPANY

we worked with described the extreme pressure he faced at all levels of his organization to deliver better fill rates. He said that the sales organizations continually communicated horror stories where customers bitterly complained about not being able to get product. "The CEO called me one day and made it quite clear that fill rates had to improve. In fact, he demanded that large three by four feet charts be posted in prominent places around the building to show the improvement in fill rates that must come about!" He then related how, during the subsequent weeks, the company struggled with manufacturing and vendor issues, which offset any internal fill rate improvements. The pressure on the supply chain organization built to an excruciating level.

Suddenly, everything changed. The metrics started to show fill rate improvements, which continued until the company's goal was achieved. The supply chain VP was amazed. He was also confused because customer complaints continued unchanged. Much later, his director of inventory management left for another company and the replacement discovered that his predecessor had directed the inventory analysts to exclude data when they calculated fill rates.

For example, when new products entered the system, it took several months for the inventory to catch up with demand. This imbalance negatively impacted the fill rates at this company, so the inventory analysts decided to eliminate that data from the fill rate calculation until the new product stabilized. They did not tell anyone, rationalizing that they were making the metric more accurate by eliminating such detail. This slippery slope became steeper and steeper, and the analysts began manipulating other "unfair situations." Eventually, the house of cards came crashing down. Several of these analysts were dismissed from the company, and the supply chain VP had to explain the abrupt and embarrassing fall in the fill metric once the data were corrected.

firm is doing and feel no urgency to surpass competitors or delight customers, thereby giving rivals an upper hand.

SUMMARY

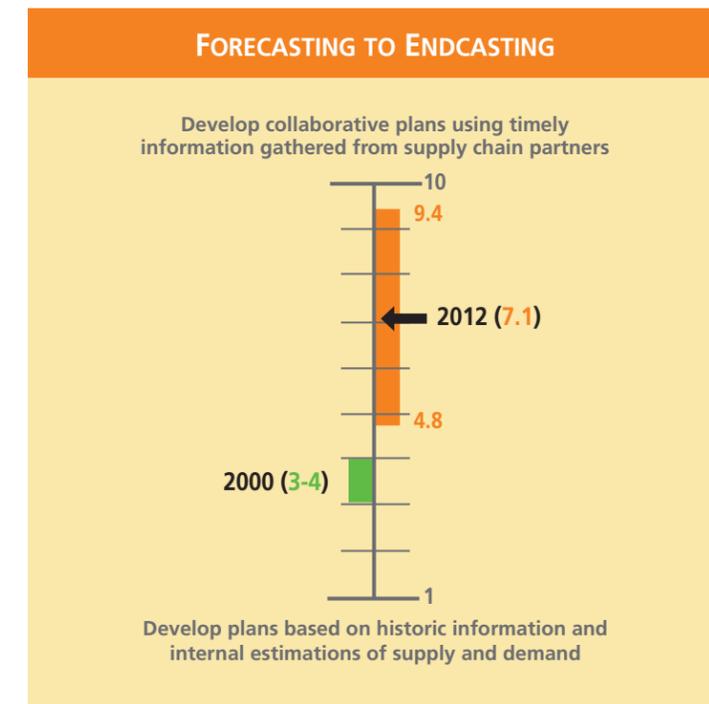
In summary, we believe you should design a new set of supply chain metrics which support the new supply chain strategy, follow a logical framework, clearly define cross-functional accountability, relate to set goals with best practice benchmarking, focus on

customers, resist gaming, and provide effective insights into how the supply chain organization is performing and where improvements can be made. In summary:

1. Create the right cross-functional accountability
2. Establish a driver-based metrics framework
3. Set appropriate goals
4. Ensure that metrics cannot be easily gamed.

FORECASTING TO ENDCASTING (Demand Management)

BY MARK MOON, Ph.D., Department Head,
Department of Marketing and Supply Chain Management



WHY IS THIS A GAME-CHANGING TREND?

Few supply chain professionals are pleased with the forecasting process in their firms. We often hear the familiar refrain, "If we could only improve forecast accuracy, most of our problems would disappear." That is very likely not true. Instead, the real issue is how the forecast plays in the cross-functional demand supply integration process and how the firm truly manages demand. We rarely see firms with a well-defined, rigorous process for managing demand. The few with those processes make game-changing transformations in their business.

John Deere is a great example of a company that has changed the game with a world-class forecasting and demand management process. In presentations at our Supply Chain Forum, Deere described how improvements in this process led to major simultaneous improvements in cost, working capital, and product availability. While many factors have led to John Deere becoming a great company, world-class forecasting and demand management process is definitely a critical factor.

IMPROVEMENT, BUT STILL SHORT OF MATURITY

No one buys a company's stock because of its forecasting skills. A company needs to do something with that forecast. They need to become adept at demand management and then translate that into higher revenue, lower cost, and higher cash flow. What will it take to get to the next level in managing demand? Before answering that, let's reflect for a moment on the progress made.

In the 2000 landmark study, the authors predicted that the trend from forecasting to "endcasting" or "demand management" was, of the 10 game-changing trends, a relative laggard, achieving a 3-4 level of maturity on a scale of 1 to 10, with 10 being total adoption and 1 representing no meaningful acceptance. The prediction was that by 2010, organizations would be operating close to the total adoption level, or a score of 10. The research supporting this white paper suggests that industry has improved substantially on this trend but with much additional opportunity for improvement.

The firms' average response to the 2012 survey was 7.1, with a range (at one standard deviation) of 4.8 to 9.4. The important takeaway from this data is that considerable progress has been made, with considerable movement toward firms developing collaborative plans with timely information gathered from supply chain partners. However, with a mean score of 7.1, much opportunity still exists for greater maturity in collaborative forecasting with supply chain partners.

THE STATE OF FORECASTING TODAY

Forecasting as a process has evolved rapidly, given swift innovations in data processing for easy storage, retrieval, and high-speed processing of detailed or granular level business data through complex forecasting algorithms.

According to research partner Ernst & Young, organizations are no longer content with using univariate forecasting, which simply uses sales or shipment history as a basis for generating the forecast; they are adopting the

use of "scenario based forecast simulations" using multiple causal variables. These input variables include macro economic factors like segmented demographics, population growth, buying patterns or trends by age group, promotions and events like 4th of July or Super Bowl. All these are used to process and generate an accurate forecast in the near term (four weeks) and a sustainable forecast in the medium (3-6 months) and longer term (2-5 years) to drive their downstream supply chains.

What is game-changing in the forecasting and demand planning realm is the ability of high end forecasting processes to "sense and respond" to dynamic and evolving customer or consumer behaviors.

According to Ernst & Young, to do this requires mining data from multiple sources including social media, public blogs, and relevant subscription based services, which provide this data (IRI, Nielsen, D&B, weather data, labor statistics) and modeled through analytical engines. These data are then processed and made relevant to the forecasting process to predict the sales of goods sold to customers at the right time and location (demand point). This demand signal is then rippled through the planning and decision support processes like Integrated Sales and Operations Planning and then through the actual execution from sales order processing to manufacturing execution.

OFFSHORING AND LONG LEAD TIMES INCREASE PRIORITY

While the original research pointed to close collaborative relationships with supply chain partners to enhance forecasting effectiveness, one macro trend has made prediction of future demand, whether that is thought of as "forecasting" or "endcasting," considerably more difficult yet considerably more important. That trend is the relentless move to offshore manufacturing to low-wage countries, particularly in Asia, but also in Latin America. One consequence of this offshoring is a lengthening of lead times for many manufactured goods.



FEW SUPPLY CHAIN PROFESSIONALS ARE PLEASED WITH THE FORECASTING PROCESS IN THEIR FIRMS.

When forecasting and managing future demand, the horizon, or the length of time out into the future that demand is being forecasted, must be at least as long as the lead time. When manufacturing is moved offshore, instead of forecasting demand two-to-three months into the future, now forecasters need to be thinking four-to-six months into the future and beyond. The longer the forecasting horizon, the less accurate the forecast will usually be. A "guess" about what is likely to happen next month will be a better guess than a guess about what is likely to happen six months from now.

Thus, one of the consequences of the trend to offshore manufacturing to low-wage countries is that the forecasts that are necessary to drive these longer lead times are usually less accurate than they would be if the manufacturing were taking place closer to the customer. When accuracy is lower, more inventory is needed to deliver acceptable service levels to customers. So offshoring has made forecasting more difficult. It also makes forecasting more important. Long lead times

result in more inventory in process throughout the supply chain, and if the forecasted demand is either way too high or way too low, the risk of obsolescence, or unhappy customers, is greater.

INTERNAL COLLABORATION AND S&OP

While many companies have improved in their ability to collaborate effectively across organizational boundaries with supply chain partners to improve forecasting effectiveness, a greater effort has been made to enhance internal collaboration between the demand, supply, and finance functions within companies to transform accurate demand forecasts into actionable business and supply chain plans.

Whether called S&OP (Sales and Operations Planning, a most regrettable term that has unfortunately found its way into the vernacular), IBP (Integrated Business Planning), or DSI (Demand/Supply Integration), these processes are designed to match future demand projections (demand forecasts) with future supply capabilities (supply forecasts) and to

formulate business plans that achieve a balanced set of goals. While any company would agree that these are worthy goals, transforming siloed organizational cultures into cross-functional, collaborative ones has proven to be elusive.

A variety of culprits are to blame for the lack of success in these processes, but failure to engage the demand side of the enterprise (sales and marketing in a manufacturing context, and merchandising in a retailing context) is by far the greatest barrier to successful S&OP implementations. Accurate forecasts are not worth the paper they're written on if they are not a part of a robust Demand/Supply Integration process. Transformation of demand and supply signals from external supply chain partners into collaborative business plans is the desired end state. Such transformation requires a collaborative organizational culture, a robust set of processes, and effective information technology tools. Considerable work still needs to be done in many companies to achieve this ideal.

FORECASTING VERSUS ENDCASTING/DEMAND MANAGEMENT

In the 2000 landmark study, "forecasting" was conceptualized as predicting the demand from supply chain partner, while "endcasting" was seen as a heightened focus on final consumer demand. CPFAR was discussed as a movement toward endcasting, in the sense that it represented a collaborative effort between retailers and manufacturers to model and then manage consumer demand.

A macro trend that has helped further this ideal of "endcasting" is the availability of vast amounts of end-user demand data. With the ubiquity of scanners, data is now available for analysis and insight into demand patterns not just from channel partners but from end consumers.

At Terra Technology, they are seeing companies actively take advantage of big data through automated analytical tools with their Demand Sensing product. In their Forecasting Benchmark Study (encompassing one-third of

North American CPG traffic from multi-nationals like Procter & Gamble, Unilever, Kraft, Kimberly-Clark, and General Mills), companies that use big data to sense demand reduced forecast error by 40%. As part of their demand-driven journey, General Mills cut seven days of inventory between 2011 and 2012 (source annual reports). These are game-changing jumps in performance that can turn into considerable financial gain.

For example, business forecasters have traditionally gravitated toward time-series methods to identify historical demand patterns that repeat with time. One of the most widely used time-series tools is the Holt-Winters approach to exponential smoothing, which was first developed over 50 years ago. Few useful time-series approaches have been developed since Holt-Winters, and with the exception of demand sensing applications, forecasters have generally lagged behind their business analytics colleagues in the use of sophisticated data tools to identify causal patterns of demand. Such causal modeling tools are more important today than ever, with the emergence of new forms of promotional tools and the growth of "shopper marketing" as a critical marketing strategy.

While time-series tools are far less useful in a promotion-intensive environment, demand sensing technology has been shown to be effective. During promotions, the same benchmark study referenced above found that the companies that sense demand reduce error by 34%, allowing them to sense consumer response to promotions and better serve customers during these high-profile events. Similar performance is experienced for new items, with Demand Sensing reducing error by 32%. Note: The study reveals that only half of all items have two or more years of history, so it's simply not feasible to use traditional time-series analysis for half your items.

Keep in mind, though, that regardless of what it's called, it's a guess about future demand, and it will always, always, always be (to some degree) wrong! Best practice is to gather as much information as possible from historical

demand patterns (statistical forecasting), current manufacturer and retailer data from nodes across the supply chain (demand sensing pattern analysis), and individuals who have insight into how the future might differ from the past (human insight). Thus, for every forecast there are multiple sources of input. How do you make sense of it all? Best practice is to relentlessly measure the accuracy of the

inputs provided from different sources and to use those measures of accuracy to judge the added-value from each input source. As an example, software exists which measures the predictive value of each input source at every item-location and uses the most predictive signals to create the best possible forecast. It gets complex really quickly, so it's a good task for software.

CASE EXAMPLE

COMPANY D, A GLOBAL MANUFACTURER of agricultural and construction equipment, collects forecast information from a variety of sources. They conduct extensive statistical analysis on historical demand patterns and then, using sophisticated tools, project those patterns into the future to create a baseline forecast. They ask their sales teams to adjust these baseline forecasts when they have insight from their large customers that previous demand patterns might change. They ask their marketing teams to adjust these baseline forecasts when they have insights about new product introductions, new market entries, or pricing actions. They also collect detailed forecasts directly from their large customers.

The forecasting team at this company compiles each of these inputs on future demand, and measures the contribution made by each. Did the sales teams' adjustment make the forecast better or worse? And by how much? Did the marketing team make the forecast better or worse? Did the customer forecast add value? Based upon these accuracy metrics, each input is assigned a "weight" at the consensus forecast meeting, and the consensus forecast is created by applying this weight to each. If the sales teams want their forecasts to be taken seriously, they have to demonstrate that their adjustments add value. This is an example of how multiple perspectives can be systematically and analytically used to create accurate and unbiased forecasts, which becomes a critical component of a global S&OP process that has resulted in lower inventories, lower operating costs, and higher customer fill rates.

TRAINING TO KNOWLEDGE-BASED LEARNING *(Talent Management)*

BY PAUL DITTMANN, Ph.D.
Executive Director, The Global Supply Chain Institute



THE NO. 1 REQUIREMENT FOR SUPPLY CHAIN EXCELLENCE IS FINDING, HIRING, AND DEVELOPING TALENTED PEOPLE AND THEN PLACING THEM IN THE PROPER ROLES.

WHY IS THIS A GAME-CHANGING TREND?

Few would argue that the No. 1 requirement for supply chain excellence is finding, hiring, and developing talented people and then placing them in the proper roles. Firms that are good at this clearly have a competitive advantage. To change the supply chain game, you have to be world-class at getting the right people with the right skill sets in the right place, and that doesn't happen without a lot of effort and focus.

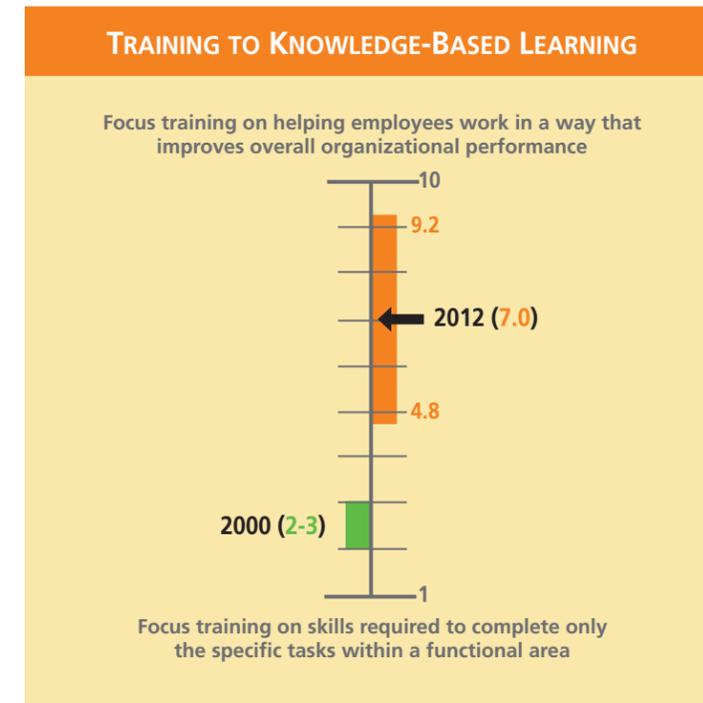
During the Great Recession, talent management took a back seat in many firms. However, one large manufacturer of consumer and industrial products decided to move aggressively against this trend. They maintained the training budget when all else was being cut. Even when salaries were reduced 10% across the board, they maintained their commitment to developing their people. They also resolved to transform their workforce, even though they had to cut headcount. They aggressively sought and hired the best and brightest talent they could find. This company believes, and we agree, that when their competitors were retrenching, they built a lasting foundation of talented people for decades to come.

EDUCATION IS BEING FOCUSED ON BROAD GOALS OF THE FIRM

If supply chain professionals had to choose one element to master to improve their performance, they invariably tell us it would be talent management. Our industry partners say that finding, hiring, and developing supply chain talent is the No. 1 requirement for transforming a supply chain. What will it take to get to the next level in managing supply chain talent? Before answering that, let's reflect for a moment on the progress made.

In our survey of over 160 supply chain professionals, we found a significant improvement in the way firms are developing supply chain talent. From the chart below, companies have clearly moved from an exclusive focus on training only for specific functional skills and have added more education focused on helping their people improve overall organizational performance.

However, training and education to develop talent is putting the "cart before the horse." Companies first need to acquire the right talent, and that means they have to define the skills and competencies needed by the modern supply chain executive. More firms have an increased expectation from supply chain leadership. For now, it suffices to note that the supply



chain, more often than not, is the prime driver of shareholder value (or owner's equity in firms). Yet most companies fail to fully leverage this pathway to driving value, often because they lack the right talent to make it happen.

THE MODERN SUPPLY CHAIN EXECUTIVE

Fifteen years ago, the supply chain leader in most companies held a title such as "vice president of logistics." This largely functional role relied on technical proficiency in discrete areas: knowledge of shipping routes, familiarity with warehousing equipment and distribution center locations and footprints, as well as a solid grasp of freight rates and fuel costs. He reported to the chief operating officer or chief financial officer, had few prospects of advancing further, and had no exposure to the executive committee. The way companies need to think of the modern supply chain executive has changed dramatically.

Supply chain executives still need to be experts at managing supply chain functions such as transportation, warehousing, inventory management, and production planning. But the supply chain process extends end-to-end

and even outside the firm, including the relationships with suppliers and customers on a global basis. Leading firms now see the supply chain functional leader as the executive to coordinate the end-to-end supply chain process, even though he or she does not control it all. Because of that added dimension of cross-function, cross-company coordination, senior supply chain executives must possess a number of unique characteristics.

SUPPLY CHAIN AS PART OF THE EXECUTIVE TEAM

Today, in a growing number of firms, the supply chain chiefs of high performance companies don't just have access to the executive team—they're part of it. That role requires not only of educating the CEO and the Board by giving them the vocabulary to talk about supply chain subjects and its critical role in creating economic profit, but in finding and driving opportunities to increase economic profit. The job in those progressive firms is no longer a mostly functional one, but instead plays a key strategic role that can influence 60 to 70 percent of a company's total costs, all of its inventory, and most aspects of customer service.



The supply chain leader in these progressive firms has global responsibility for coordinating processes across functional silos like sales, R&D, and Finance, as well as functional responsibility for activities like procurement, logistics operations and production planning, and customer service. He or she pays as much attention to the demand side as to production and materials planning, and knows what it takes to reliably deliver products to customers and to build mechanisms to learn what customers have to say.

Finding talented people who can grow into these roles is, according to one of our surveys, the most challenging aspect of supply chain people management. Developing,

retaining, and evaluating talent are also daunting tasks, but simply finding and successfully hiring top talent seems to be the most challenging of all.

Consistent with our research, the Chief Supply Chain Officer Report 2012, published by *SCM World* in October 2012, reported that the percentage of respondents who thought certain aspects of talent management “extremely or somewhat challenging” were:

- Finding Talent: 83%
- Hiring Talent: 77%
- Developing Talent: 66%
- Retaining Talent: 66%
- Measuring Talent: 47%.

It should be no surprise that finding and hiring top talent is at the top of the list. Demand for the most talented supply chain professionals will continue to rise, and hiring and retaining them will continue to tax the best organizations. Companies must “sell the opportunity” to candidates much more adroitly. So what must firms do to ensure that they have the supply chain experts who can drive true strategic success? First they must create the right environment, then acquire the very best supply chain talent available, and finally, aggressively develop that talent. Finding top talent starts with identifying its critical characteristics.

THE CRITICAL COMPETENCIES OF TOP SUPPLY CHAIN TALENT

The best talent can only be acquired after it has been identified. To select the right people to oversee the increasingly pivotal supply chain responsibility, firms must know the blueprint for the “dream” supply chain leader. Our recent book, *The New Supply Chain Agenda*, groups these characteristics into five key competencies:

- Global orientation
- Cross-functional, cross-company understanding
- Leadership skills
- Technical and analytics savvy
- Superior business skills.

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Embedded in all of these is the need for a strong focus on relationship management skills with internal customers, employees, and external partners.

Global Orientation

Of course, nearly all senior business executives today need to be globally capable. Global sourcing and global supply chains have expanded tremendously in recent years, for both retailers and manufacturers. There are few companies that do not either source globally, sell globally, or have competitors that do. Therefore supply chain executives must manage an enterprise that extends across continents and must deal effectively with suppliers and customers worldwide.

Global executives we talk with say that resources to help them learn all of this are few and far between. Just being aware of the myriad rules and regulations is a daunting task. Most have learned via experience. And in fact, this may be the only effective way to truly internalize global knowledge. It’s why companies like P&G require their high-potential employees to have a global assignment before they can be promoted to the executive level. And it’s why supply chain executives with global knowledge are so extremely valuable.

Cross-Functional, Cross-Company Understanding

Unlike some other senior executives, supply chain executives must embrace the added dimension of cross-functional and cross-company complexity—the challenge that comes with thinking of the end-to-end supply chain as an integrated system. Manufacturing or Sales executives must develop deep expertise and a strategy for their area. But the supply chain executive must also comprehend the connections and interdependencies across procurement, logistics, manufacturing, and marketing/sales. In addition, he or she must also absorb the complexity of interfaces outside the firm, with suppliers and customers.

Leadership Skills

A growing number of today’s supply chain leaders are front-and-center within the organization. They must be able to foster

close interpersonal relationships that build credibility for them and for the function across the organization. They must be able to build teams and manage people and must communicate their message compellingly to multiple stakeholders. They find themselves in the position of having to influence others in the firm to work together to create a world-class supply chain. To get the whole picture, they are masters at building close collaborative relationships with their companies’ leaders in sales and marketing, human resources, and finance.

Technical and Analytics Savvy:

Technology has become a key enabler of supply chain excellence, and spending on supply management applications and services continues apace. Indeed, in our work across hundreds of companies, including retailers, manufacturers, and service providers, we almost always see that supply chain often consumes the majority of the IT spend in firms, with that spending supporting warehouse management systems, transportation management systems, inventory management and production planning systems, etc. The supply chain chief need not be credentialed in IT systems or other technology areas, but he or she must know what to avoid and what questions to ask to successfully guide the implementation of new supply chain technologies.

The need for analytics capability is exploding. The expanding role of the supply chain in most firms leads to an exponentially higher level of complexity and therefore an expanded need for analytics and modeling skills. Yet such skills are in alarmingly short supply. According to a McKinsey & Company study, by 2018 the United States could face a shortage of 1.5 million managers and analysts with the know-how to use big data to make effective decisions. Academic institutions and companies must partner to find ways of developing these skills to meet the ever-expanding demand for them.

Superior Business Skills:

Supply chain leaders must be business people first and supply chain specialists second.

Their foremost focus must be on enhancing economic profit and shareholder value, not simply on cost cutting. Supply chain leaders must be able to speak the language of senior executives as easily as they can talk about fleet-truck efficiencies or demand forecasting. Terms such as EBITDA, ROIC, and shareholder value should be part of their everyday parlance, and supply chain leaders should be as comfortable discussing cash flow with the treasurer's office as they are with talking about delivery schedules with suppliers. Supply chain issues are often the least understood by the Board and the CEO, and they must be explained in their language.

ACQUIRE THE BEST TALENT

After carefully determining the right mix of functional proficiencies and the right combination of the five universal characteristics discussed above, companies must enter the contest for talent. Engaging in the battle for scarce talent involves viewing the world, other industries, and supply chain management training programs as the talent basket. Supply chain management is no longer limited by national borders or industry boundaries. Leading practitioners consider the world their "talent basket." Their searches extend accordingly to India, China, Brazil, Europe, and beyond.

FROM TRAINING TO KNOWLEDGE-BASED LEARNING

Finally comes the need to develop talent for key supply chain process roles. This involves creating a professional development plan for every manager in the supply chain organization. Too many supply chain managers lack sufficient knowledge of how the rest of the company runs. Leading firms think creatively as they create ways to develop the talent needed. Any global approach to talent will not succeed easily; it will require a major effort, involving detailed planning of an array of leadership development initiatives.

Universities especially are stepping up not only with more appropriate education for the

growing numbers of aspiring supply chain leaders but also with executive education programs that help shore up the business savvy of established supply chain specialists. When it comes to functional expertise, companies can do more to align and drive new phases of supply chain education at all levels. And there is more room for universities to go further in providing more universal supply chain management skill sets.

Our survey results (see chart at the beginning of this section) show a huge improvement in the focus on education to improve overall performance of the firm instead of only narrow training in a specific area of expertise. Companies, of course, still need to offer these specific training programs; but it is encouraging to see that firms are moving beyond that to knowledge-based learning. There is still a long way to go, but companies have taken a major step forward in the past 12 years.

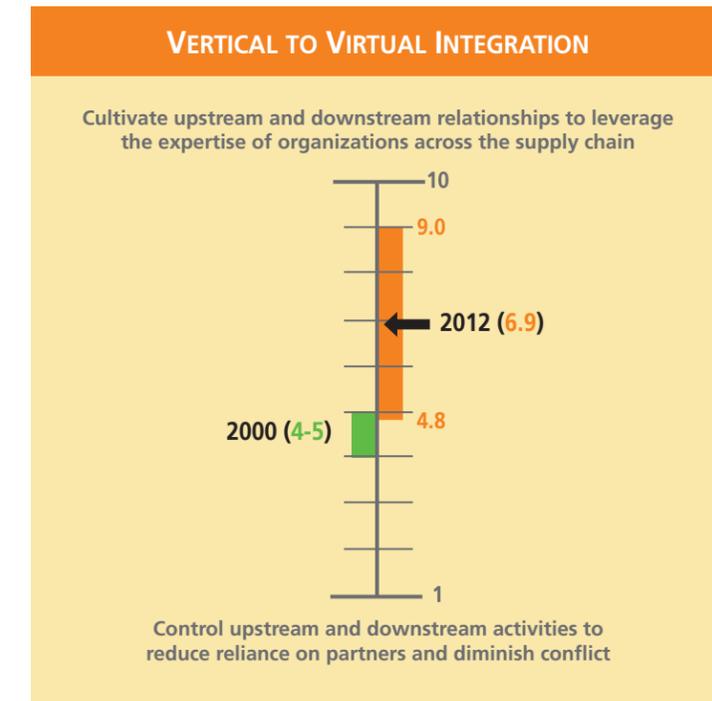
We hear from more and more companies that they are sending folks to training but are unsure how to reinforce and internalize the education so it sticks and is used. Leading companies are focusing on post training programs to make sure their people apply the skills learned. Some of these firms line up projects right after the education session so that the skills learned can be employed. The idea is to move from simply "checking the box" on a training objective to truly seeing a business benefit.

CONCLUSION

Few would argue that acquiring, developing, and retaining the right talent is a critical element in building a world-class supply chain. Finding supply chain talent is a special challenge due to the cross-company, cross-functional challenges that need to be embraced. Therefore, the five key talent characteristics discussed above are even more critical for supply chain executives. A talent plan is clearly an essential part of the strategy to drive supply chain excellence.

VERTICAL INTEGRATION TO VIRTUAL INTEGRATION

BY WENDY TATE, Ph.D.



WHY IS THIS A GAME-CHANGING TREND?

One of the fundamentals of business is to stick to what you do well and leave the rest to world-class service providers. But outsourcing to a third party service provider should be based on a well-defined strategy to optimize the leverage they provide. Third party experts can help you change your supply chain game but only if you follow a well-defined set of best practices.

For example, a manufacturer and distributor of food products decided to outsource the operation of their DCs to a third party supplier. After the first year, neither party felt good about the performance. In effect, there had been no improvement and no savings. But then the firm decided to employ a vested outsourcing model. (See Kate Vitasek's books on vested outsourcing.) With this new model, the firm restructured the 3PL contract to pay for results, not just activities, and they further provided win-win incentives for the 3PL to help them make improvements. This allowed the firm to reach new heights in serving their customers and serve them with less cost and inventory. On-time delivery improved from 80% to 98%, lead times were cut by 55%, and together the two parties shared the \$22 million of cost taken out of the operation.



THIRD PARTY EXPERTS CAN HELP YOU CHANGE YOUR SUPPLY CHAIN GAME, BUT ONLY IF YOU FOLLOW A WELL-DEFINED SET OF BEST PRACTICES.

LEVERAGING THE EXPERTISE OF THIRD PARTY SUPPLIERS

The chart on page 41 shows significant progress in leveraging the expertise of third party suppliers as the outsourcing trend advances. What will it take to get to the next level in using third party providers for maximum advantage? Before answering that, let's reflect for a moment on the progress made.

This trend was definitely in play 13 years ago. In the past decade plus, firms have continued to move to more of a virtual integration model with more third party materials and service suppliers. And they have moved gradually away from the old vertical integration models. But this hasn't happened across the board. Many organizations have remained vertically integrated to reduce reliance on others and to reduce conflict. Firms have stayed vertically integrated because it provides a number of benefits, including retention of intellectual property, better control of costs, quality, and delivery. Vertical integration also allows an organization to better retain institutional knowledge and focus on competencies.

But the outsourcing trend continues to advance due to the many vertical integration problems, which include the considerable capital investment required, a highly complex organizational

structure, and the lack of an available and dedicated workforce. Vertical integration may also inhibit innovation and other market opportunities for an organization.

THE BENEFITS OF VIRTUAL INTEGRATION

Reliance on an outsourced third party relationship with material and services suppliers helps to overcome the financial burden of capital investment and opens access to a larger pool of skilled labor and management. The benefits of virtual integration include the potential for reduced price and labor cost, increased knowledge, and access to a larger customer base. Virtual integration can also introduce risk, supply chain disruption, fluctuating costs, and variable quality. Virtual integration may also require an investment in supply chain relationships that causes a shift in power and a loss of control.

In 2000, vertical to virtual integration scored an average of 4-5 level of maturity on a scale of 1 to 10, with 10 being total virtual integration to leverage the expertise of organizations across the supply chain, whereas 1 represents total vertical integration. The prediction was that by 2010, organizations would be operating close to the virtual integration level, or a fully outsourced model, with a pervasive use of third party suppliers. The research supporting this white

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paper suggests that industry has continued to move gradually toward virtual versus vertical integration but not at the rate originally thought. What happened to slow the trend? Will this trend actually reverse itself? There have been highly publicized issues introducing risk and disruption to the supply chain that have caused organizations to continuously rethink and revise the virtual versus vertical integration strategy.

SUPPLY CHAIN DISRUPTIONS ARE COMMON

We don't want to confuse a discussion of outsourcing in general with global outsourcing in particular. But global outsourcing especially can demonstrate dramatically the risks involved in some outsourcing relationships. None are more sobering than those caused by natural disasters. For example, natural disasters like the 2011 earthquakes in Japan or the floods in Thailand are somewhat predictable in the sense that Japan is a volcanic region and Thailand is prone to flooding; but the scale of the 2011 events proved more extreme than most risk managers could account for. The Honda factory in central Thailand was under 15 feet of water at the high point of the flooding. This incident was minor compared to the March 11 earthquake, tsunami, and subsequent nuclear crisis that engulfed Japan. Toyota suspended production of the Prius in Japan after this event, losing 140,000 badly needed vehicles.

Hundreds of other companies faced major disruptions to their supply chains from this disaster, some lasting through the end of the year. For instance, Boeing experienced major delays as a result of the tsunami because the impacted Japanese suppliers produce 35% of the Boeing 787 components and 20% of the Boeing 777 components. General Motors had to halt production in several plants due to shortages from Japanese suppliers. Honda faced severe problems because 113 of its suppliers were located in the affected region of Japan. These twin disasters in Asia in 2011 produced an estimated \$240 billion in losses.

Given events like this, many firms have concluded that a balance of the two extremes is the most logical solution. Rather than outsource everything, they outsource and offshore services and materials in the geographic places that make

the most sense from both a total cost, total risk, and from a customer value perspective. They now understand that effective virtual integration requires the cultivation of upstream and downstream relationships across many different geographies to mitigate the risk of increasing labor and investment costs and continuing problems with natural and unexpected disasters.

VIRTUAL INTEGRATION OF GOODS: OUTSOURCING

Over the past decade plus, there have been many reports of manufacturing being outsourced, offshored, near-shored, and most recently re-shored. But for the reasons enumerated above, companies are taking a different view and trying to understand the "right shore" or the right place for their supplies of manufactured goods. Yet the pull of extremely low labor costs and relatively low transportation costs continues to drive many companies to consider manufacturing and outsourcing to suppliers located in other regions of the world, including Africa, South America, the Middle East, and India.

VIRTUAL INTEGRATION OF SERVICES

At the turn of the century, there was a significant trend in services or knowledge process outsourcing and offshoring. Many staff and design activities were being outsourced to consultants. Information design, collection, maintenance, and analysis were outsourced to experts in information integration. Customer contact centers, R&D, human resource, and even purchasing functions were outsourced to areas with a pool of skilled laborers who were willing to contribute to necessary cost reduction efforts. Technology integration played a key role in virtually integrating these services suppliers. These trends for outsourced services continue but have slowed somewhat for many of the reasons stated above.

CURRENT TRENDS AND IMPLICATIONS

Will the outsourcing trend actually reverse in the future? There is evidence that suggests that forces may be shifting, and in fact some companies are bringing both manufacturing and service production back home. The question that executives are asking today is, "What makes sense for



our organization? What are the key considerations in making a location decision? Will there be any new preferred offshore locations, or are some manufacturing jobs and suppliers starting to move closer to the geographic regions where customers/consumers are located?"

The 2008-2010 Great Recession motivated companies to re-evaluate their global supply chain strategies. Contributing to this assessment was the rapidly rising cost of labor in emerging economies, high oil prices, increasing transportation costs, and a growing awareness of global risks. Beyond higher total cost and increased risk, many firms cite intellectual property erosion and product quality problems as the underlying reason that some offshore regions are falling out of favor as the low cost manufacturing locations of choice. Other factors influencing the decision to move closer to home include increased supervision and training on manufacturing and inspections, higher local security needs, and extra expenses associated with travel and telecommunications. According to recent research, 56% of offshoring companies are experiencing unexpected increases in total landed costs.

In recent CSCMP sponsored research, 40% of respondents indicated that they perceived a trend toward re-shoring to the United States within their industries. More than 60 percent of respondents indicated that the stability of transportation costs would become more important in their location choices in the next three years. Additional logistics-related factors were expected to become more important, including the availability of knowledgeable logistics service providers, the availability of transportation, and transportation reliability.

Companies are re-examining the location decision of manufacturing and suppliers in an effort to expand beyond cost and instead considering risk combined with a total cost perspectives. The cost of moving to a different geography is an important consideration in choosing a manufacturing and outsourcing location, and the decision is being approached with a longer time horizon, consideration of

more strategic issues, assessing and monitoring competition, and listening to the voice of the customer.

In December of 2012, Apple announced that it was going to invest \$100 million to contract with third parties to make Macs in the United States. America is Apple's largest market, and being geographically close to markets can help responsiveness. Also, moving some production out of China will help Apple to diversify sourcing risks: natural events, political events, protectionism, rising wages, and others. Earlier this year General Electric started to manufacture products in the United States, after 50 years of inactivity in the facilities. The move was largely driven by increased oil prices, decreases in the cost of electricity and natural gas, increased wages in China, increased labor productivity, and a change in priorities for American unions.

Vertical and virtual integration decisions tend to follow a very unpredictable pattern. As the length of supply chain continues to fluctuate, relationship management, performance measurement, and an in-depth understanding of the total value creation process will become paramount capabilities for success. Value can only be delivered if products and services are in the right place, at the right time, at the right price. This is one trend that may reverse itself in the future.

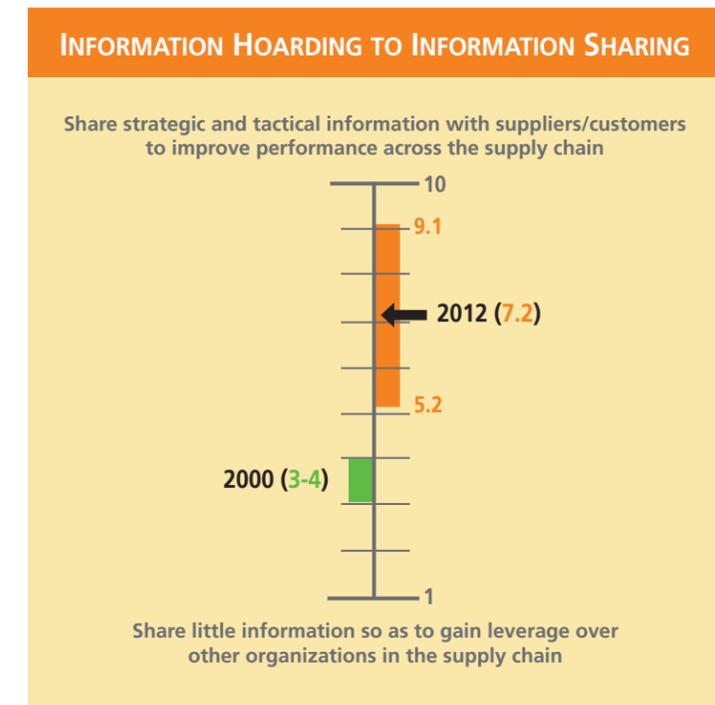
Finally it should be noted that some professionals we have spoken with disagree with some of these conclusions. Some believe that outsourcing decisions follow predictable patterns. Executives carefully consider (and always have) all the implications of their operating model decisions—tax benefits, transportation cost impacts, labor arbitrage and inflation factors, and customer experience.

It should be noted that some supply chain professionals do not believe that the use of outsourced resources will diminish in the future. They point out that more and more companies are focusing on what they believe they do best. Using third parties will continue, although the locations will undoubtedly change. This debate will continue until the trends become clearer.



INFORMATION HOARDING TO INFORMATION SHARING AND VISIBILITY

BY RANDY BRADLEY, Ph.D.



WHY IS THIS A GAME-CHANGING TREND?

The use of business intelligence and analytics to analyze so-called "big data" and make visible its key messages is a trend that is sweeping across industry and the academic community. A few firms are changing the game by linking together masses of information from multiple sources and then analyzing that data with increasingly powerful hardware systems and business analytics expertise. Firms need to make sure they have a plan to catch this game-changing wave.

P&G is a clear leader in this area. As CEO Bob McDonald said, "We see business intelligence as a key way to drive innovation. To do this we must move business intelligence from the periphery to the center of how business gets done." The challenge with big data is that there is too much of it to process manually. Companies are overwhelmed with data. We are seeing that real benefit is being provided by automated systems to sort through masses of data, extract valuable information, systematically feed it into SCM systems, and only alert folks when human attention is required.

MODERATE PROGRESS

The management of information in today's rapidly evolving global environment is clearly key to supply chain excellence. What will it take to get to the next level in information management? Before answering that, let's reflect for a moment on the progress made.

The 2000 study predicted that the information hoarding to information sharing trend was one of the least advanced of the 10 game-changing trends, achieving a 3-4 level of maturity on a scale of 1 to 10, with 10 being total adoption and 1 representing no meaningful acceptance. Although there was no prediction for 2010 that organizations would be operating close to the total adoption level (i.e., a score of 10), significant progress was expected (e.g., level 8-9 maturity). The research supporting this white paper suggests that industry has made moderate progress in moving toward total adoption of an information sharing philosophy.

Given that most responding organizations have yet to achieve total maturity, while some have barely eclipsed level 5 maturity, there remains great room for improvement. For instance, the average among the firms responding to the 2012 survey was 7.2 with a range (at one standard deviation) of 5.2 to 9.1. As you can see, virtually none of the responding organizations have reached the point of total adoption, whereas an inordinate number of organizations have been slow to embrace the sharing of strategic and tactical information with suppliers and customers to improve performance across the supply chain. With an average maturity level of 7.2, information hoarding to information sharing remains one of the greatest areas of opportunity to improve supply chain performance.

ENTERPRISE SYSTEMS

The term *enterprise* is used loosely, as the boundaries of the term have changed over time. Yet many so-called enterprise solutions adopted by organizations have failed to evolve in a manner that is representative of organizational boundary expansions. We must remember that enterprise systems are

primarily and generically designed to address the issue of information fragmentation in organizations. On the other hand, "best of breed" systems provide customers with software designed for cross-enterprise planning and execution, and provide a built-in network of trading partners.

Most companies start with their enterprise systems as the first step in harnessing big data. By using this data, companies can sense and respond to quickly changing market realities. It's a game-changer for manufacturers: the result (quantified in Terra Technology's Forecasting Benchmark Study) is an average 40% reduction in forecast error.

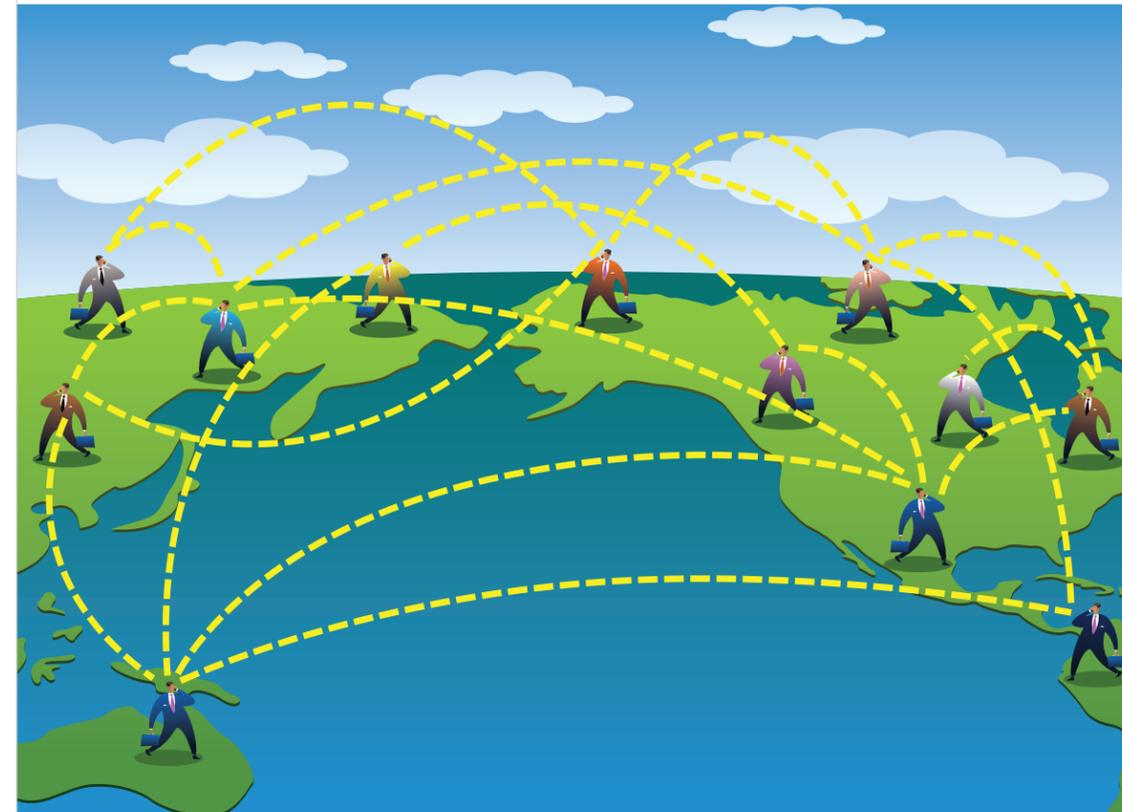
HOW DO WE MOVE FORWARD FROM HERE?

Moving forward, there are a number of actions that can help move organizations closer to full adoption of sharing strategic and tactical information with partners/customers to improve supply chain performance. The secret is an ability and willingness to collaborate with partners and customers. This is easier said than done when you consider the velocity and volume of data creation and turns (e.g., the continuously changing positions of forecasts, orders, shipments, inventory). This challenge is complicated enough within the traditional enterprise and is rather daunting in the context of a global supply chain network, with its multiple tiers of partners trying to manage information exchanges across a variety of hardware and software platforms.

The systematic use of downstream data to improve operational decisions will be the future for creating responsive and resilient supply chains. Leaders using downstream data are seeing an additional 35% reduction in forecast error.

THE SUPPLY CHAIN NETWORK AS A SOCIAL ORGANISM

Consider that a supply chain network is a social organism whose success/value is predicated upon its ability to enable or support collaboration among all participants and stakeholders. Given that today's global supply



FIRMS ARE CHANGING THE GAME BY LINKING TOGETHER MASSES OF INFORMATION FROM MULTIPLE SOURCES.

chains require reliable access to real-time, cross-network data, high-quality information begins with a solid, scalable integration platform that connects all trading partners in the extended network. The form of collaboration needed goes beyond the traditional approach of one-to-one sharing of documents. Rather, organizations will need to achieve 360-degree level visibility based on real-time information across a network that provides a single source of truth.

This requires one-to-many and many-to-many sharing of data and information. One organization shares with many partners/customers (as necessary), and all those partners/customers share with many extended partners/customers. In essence, this approach enables all relevant participants—within the organization and across the supply chain network—to access a shared version of the truth in real-time. Additionally, this approach to information sharing provides more than just access to meaningful data; it also provides access to a variety of smart people, all working

together with timely, accurate data across the global network. The end result will likely be faster, better decisions that can yield improved cost-efficiency, profit, partner relationships, and customer satisfaction.

In line with this trend, most major retailers in North America have started sharing data with partners (including BJ, Costco, CVS, Dollar General, Family Dollar, Food Lion, HEB, Home Depot, Kmart, Kroger, Lowes, Meijer, Petco, Petsmart, Publix, RiteAid, Safeway, Sam's Club, SuperValue, Target, Walgreens, and Walmart). The challenge for manufacturers is to use the latest technology to make meaningful change.

INTEGRATED ENTERPRISE SOLUTIONS WILL BE REQUIRED

As you can see, this is not simply an enterprise system—addressable area in the traditional sense. Rather, the abovementioned approach and results require organizations to focus on integrated enterprise solutions that provide customers with software designed for

cross-enterprise planning and execution as well as a built-in network of trading partners. They must focus less on so-called enterprise solutions designed only for inside the traditional enterprise (i.e., inside their own organizational boundaries). In essence, organizations that want to reach total adoption of information sharing must embrace the idea that this is as much a network issue as it is an enterprise system issue. This is especially true since the network is the glue that ties trading partners and their systems together to collaborate in a manner that can lead to improved performance in the supply chain.



THREE KEY ISSUES

Finally, three other key issues must be addressed in your quest to reach total adoption of information sharing.

Big Data and Key Insights

Avoid getting caught in the trap of focusing on and being inundated with Big Data. Remember that value resides in the insights (transformational information derived from the data) that can be leveraged for improved competitive advantage. Focus on those insights.

Data Quality

Determine what constitutes high-quality data by developing specific metrics for measuring quality of the information. Data is only good if it yields good, actionable insights. As such, the tools you use to store, aggregate, and analyze the data play a vital role in determining the quality of your data. Remember, all analytics tools are not equally adept at handling certain types of data and their inherent anomalies.

The Breadth of Your Anticipated Supply Chain Network

Choose solutions that enable or enhance your ability to improve collaboration among members of your anticipated supply chain network. Consider what the breadth of your supply chain network (e.g., multi-echelon, domestic, global, multi-party) will look like and recognize that it, in essence, should be a starting point for determining your "new enterprise" (i.e., your new boundaries).



GAME CHANGER

Some call it a cult, others a cultural phenomenon. Either way, who can't marvel at this handheld device weighing less than five ounces that offers instant entertainment, education, and communication? Just four years old, the iPhone is considered by some to be the most influential consumer electronics product of all time.

MANAGERIAL ACCOUNTING TO VALUE-BASED MANAGEMENT

Using Supply Chain Excellence

BY PAUL DITTMANN, Ph.D.
Executive Director, The Global Supply Chain Institute

WHY IS THIS A GAME-CHANGING TREND?

The key message in the book *The New Supply Chain Agenda* is that the most neglected pathway to increasing shareholder value runs through supply chain excellence. To change the game, firms need to leverage the full potential of their supply chain to achieve breakthrough financial performance.

For example, in the 1990s, the relationship between supply chain excellence and shareholder value was not well understood. Gary Balter, Managing Director of Credit Suisse, observed that few analysts likely appreciated the major change that occurred at Target in the late nineties and early 2000s. They went from a distribution system clogged with slow turning merchandise to a flow-through system, with distribution centers dedicated to carry fast-turning merchandise. Balter observed that this resulted in a major reduction in inventory, with improved product availability. But as their supply chain improved, so did their relative stock market performance versus Walmart and Kmart.

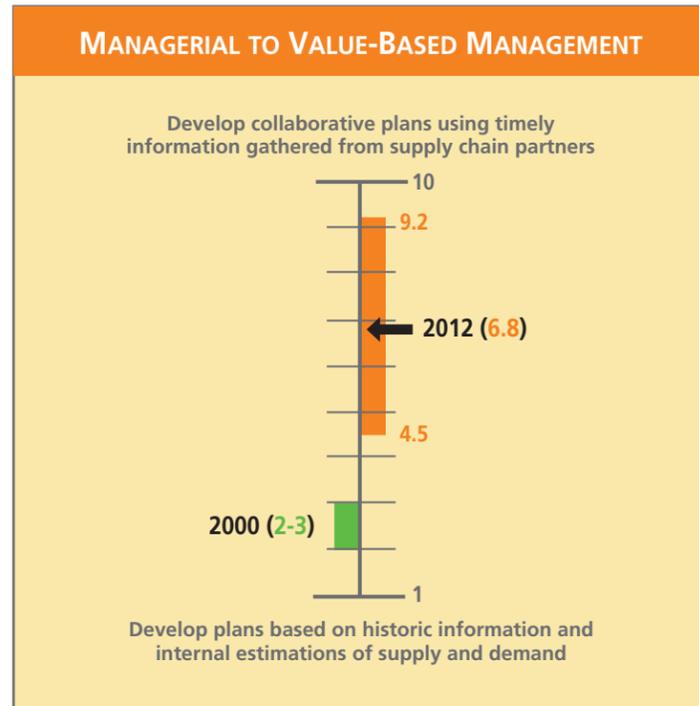
Interestingly, when Walmart began their Remix supply chain program later, all stock market analysts focused on it. Walmart highlighted it because by that time analysts and Wall Street were beginning to appreciate the positive impact and importance of supply chain. More CEOs and Boards are taking notice due to stock analysts' consistent questions regarding the state of the firm's supply chain and Wall Street's reward for supply chain performance.

MANAGING OVERALL COMPANY VALUE WITH THE SUPPLY CHAIN

More and more firms clearly understand that their supply chain is perhaps the most critical lever in creating shareholder value. What will it take to get to the next level in optimizing the overall value of the firm through supply chain excellence? Before answering that, let's reflect for a moment on the progress made.

In our survey of over 160 firms, we found much progress from 13 years ago in the commitment to measure individual department performance, based on the overall value delivered to the firm versus purely budget focused, functionally specific metrics. The chart on the next page shows much progress, with more opportunity ahead.

The opportunity to improve in this area should not be underestimated. In fact, many firms need to expand their thinking dramatically. The supply chain can be the prime driver of shareholder value (or owner's equity) in



firms, yet most firms have not fully leveraged this pathway to driving value.

DRIVING SHAREHOLDER VALUE WITH YOUR SUPPLY CHAIN

Given the hype of the last 10 years surrounding the supply chain excellence of companies like Walmart, Toyota, and Amazon, why do so many firms still not get it? The success of firms in Gartner’s Top 25-ranked supply chains, such as Apple, IBM, and Procter & Gamble, should have focused everyone on supply chain as the driver of shareholder value. We hear a lot of talk about the importance of supply chain, but actions often do not match the words.

The most neglected pathway to increasing shareholder value (or owner’s equity in privately held companies) runs through supply chain excellence. This isn’t a cost-cutting argument, though supply chain excellence often dramatically reduces costs over the long term. In fact, reaching supply chain excellence is expensive, both in terms of executive attention and actual cash outlays. Supply chain excellence drives shareholder value because it controls the heartbeat of the firm; that is, the fundamental flow of

materials and information from suppliers through the firm to its customers. Unfortunately, too many companies have a supply chain where a lack of strategy, the lack of talent, a misapplication of technology, internal and external silos, and a basic lack of discipline in managing change cripple this flow.

The supply chain isn’t just trucks, pallets, and warehouses. But being trapped in that traditional view is one of the primary reasons that few companies are taking advantage of the shareholder value opportunity presented by supply chain excellence. You, like many executives we talk to, may be skeptical that investing in this new, expansive vision of a supply chain is worth it. So we’ll begin by looking at the unequivocal link between supply chain excellence and shareholder value by focusing first on economic profit, which is the linchpin between the two.

DRIVING SHAREHOLDER VALUE WITH YOUR SUPPLY CHAIN BY CREATING ECONOMIC PROFIT

Economic profit very simply is profit less the cost of capital needed to generate that profit. Economic profit is important because it means the company is delivering returns

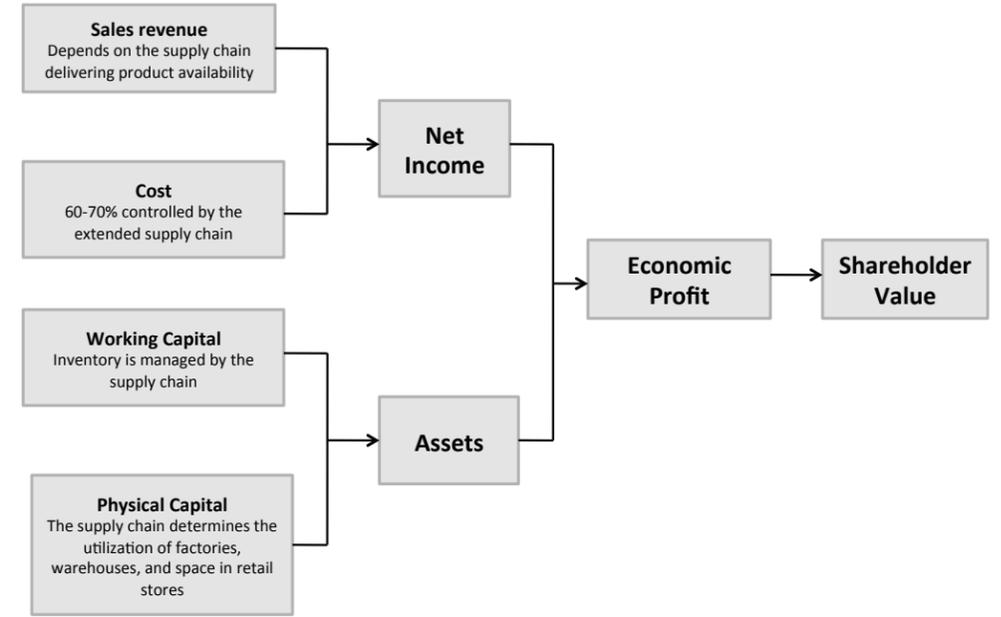


FIGURE 1. An illustration of how changes in revenue, cost, working capital, and fixed capital flow into economic profit and ultimately to shareholder value.

above the cost of the capital invested. Generating economic profit should be the prime goal of all firms. Most CEOs intuitively know that economic profit drives shareholder value. But many don’t clearly comprehend the linkage that begins at supply chain excellence and continues to shareholder value via economic profit. Supply chain excellence very often can deliver the most upside to economic profit and shareholder value because its full potential has been so underutilized in the past versus other corporate initiatives.

INCREASED ECONOMIC PROFIT MEANS INCREASED SHAREHOLDER VALUE

When economic profit increases over time, shareholder value increases. Stern Stewart & Co. has done extensive research on this concept, which they call EVA (economic value added). They have shown through extensive analysis in many companies that the relationship is very strong, especially over time, and when the data are normalized.

The Supply Chain Drives Economic Profit

In an increasing, but still small number of firms, the CEO and the Board understand the value of the supply chain to their firm. But many other CEOs, battered by an immense

range of items competing for their attention, do not see this link clearly. Yet the link is there. Using the expansive view of supply chain described above, in most firms the supply chain controls most of the inventory, manages 60-70 percent of the cost, provides the foundation to generate revenue by providing outstanding product availability, and manages most of the physical assets of the firm.

The Great Recession of 2008-2010 dramatically increased the focus on economic profit. In an era of tighter credit, supply chain levers can be used to free cash reserves from balance sheets rather than depending on restricted credit markets. The opportunity to increase shareholder value in the future even more than the past will be to take care of both the income statement and balance sheet through supply chain excellence

CONCLUSION

Today, a small but growing number of companies are reporting that they leverage their supply chains to make working capital and cash flow improvements that drive economic profit and shareholder value. Future supply chain organizations must focus on far more

than just driving out costs and improving product availability. Instead, they need to become an engine of overall financial improvement for their companies. Smart companies will use innovations in their supply chain to generate the cash to fund innovations in their product lines and growth in their business.

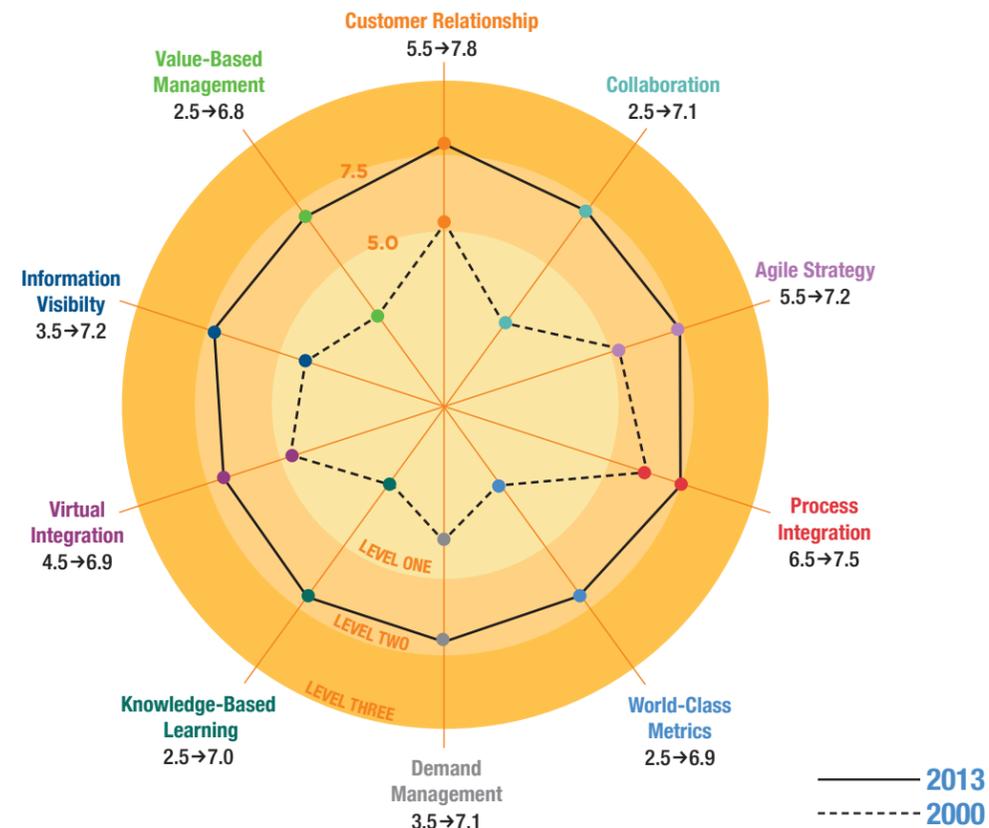
When the credit markets froze in 2008-2009, a few firms realized that they could free up cash internally without having to go to the banks. A study by Ernst & Young showed that \$1.2 trillion (equivalent to 7% of their aggregate sales) is unnecessarily tied up in working capital across 2,000 of the largest companies headquartered in the United States and Europe.

A major lesson learned in our work with many firms is that this focus must be driven from the top of the company. Without strong,

consistent support by the CEO, the CFO, and the COO, many initiatives cannot be successful due to the massive alignment of functional silos required. The fundamental learning from the case, surprising in its power, was how supply chain can be used as a lever to dramatically lower working capital and improve cash flow. Since these changes positively affect economic profit, investors reward these efforts as they realize higher shareholder value.

The supply chain will not drive economic profit without a supply chain strategy. After working with hundreds of firms, we have surprisingly found very few that have a real supply chain strategy. To succeed, a very basic prerequisite exists. The supply chain organization must challenge itself to take a broad economic profit based view, and they must understand his language and the language of the Board.

GAME-CHANGING TRENDS EVOLUTION



A FINAL NOTE

We hope you have found the material in this white paper helpful and useful. We at the University of Tennessee are committed to translating our No. 1 position in academic research into information useful for practitioners. We believe the real world of industry is our laboratory. It's why we have the largest Supply Chain Forum in the academic world, with over 50 sponsoring companies. We are always looking for industry partners to assist us in this journey. Let us know if you are interested in being one of our valued partners:

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