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Staff Paper

SUPPLY CHAIN INTEGRATION IN THE FOOD AND CONSUMER GOODS INDUSTRIES

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ABSTRACT

The interorganizational structures necessary to implement and achieve the logistical performance improvements identified in the Efficient Consumer Response (ECR) initiative and related supply chain management concepts are difficult to develop. Firms continue to struggle to implement integrated programs and techniques, particularly with respect to changing operating structures, relationships, and mindsets to facilitate true supply chain integration. This research explores the logistical strategies and structures used by selected food and consumer goods firms to integrate their supply chains. It illustrates effective integration strategies and identifies critical success factors and barriers to successful ECR implementation. A framework is used to guide managers in developing the competencies essential to integrating the supply chain and to establishing the relationships necessary to operate in an ECR environment. The framework, entitled Supply Chain 2000, depicts supply chain value creation as achieving synchronization and coordination across four critical supply chain flows: product/service; market accommodation; information; and cash.

**SUPPLY CHAIN INTEGRATION
IN THE FOOD AND CONSUMER GOODS INDUSTRIES**

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EXECUTIVE SUMMARY

The interorganizational structures necessary to implement and achieve the logistical performance improvements identified in the Efficient Consumer Response (ECR) initiative and related supply chain management concepts are difficult to develop. Firms continue to struggle to implement integrated programs and techniques, particularly with respect to changing operating structures, relationships, and mindsets to facilitate true supply chain integration. To date only a limited number of firms have been able to maneuver through the stages of application and implementation of these best practices. A large number of food and consumer goods enterprises continue to pursue strategies based upon the principles of forward buy and diversion.

This research explores the logistical strategies and structures used by selected food and consumer goods firms to integrate their supply chains. It illustrates effective integration strategies and identifies critical success factors and barriers to successful ECR implementation. A framework is used to guide managers in developing the competencies essential to integrating the supply chain and to establishing the relationships necessary to operate in an ECR environment. The framework, entitled Supply Chain 2000, is based on ten years of research at Michigan State University. It depicts supply chain value creation as achieving synchronization and coordination across four critical supply chain flows: product/service; market accommodation; information; and cash.

The research, which was generated from interviews with 29 firms in the food and consumer goods industries, benefits firms at varying degrees of supply chain integration. Firms just beginning to discuss and consider the merits of supply chain logistics integration can use this report to jump-start the actual implementation of these techniques. Firms already involved in some elements of supply chain logistics integration can learn new improvement techniques.

Firms that have already achieved significant progress in supply chain logistics integration can use the examples described within to benchmark their progress and guide them into new integration areas that can provide enhanced performance.

The report is organized as follows:

- Discussion of the *Supply Chain 2000 Framework* that examines the logistics and supply chain competencies used by the best firms in the world.
- Development of *Integration Strategies and Tactics* that serve as the foundation for the Supply Chain 2000 framework. This discussion provides examples of companies implementing various strategies and tactics. Examples vary in the level of sophistication from early implementation to advanced application of ECR and supply chain integration techniques.
- Discussion of the *Barriers to Implementation* found in the case examples.
- A summary of the *Success Factors* for supply chain integration commonly found across the examples studied.

The research results in this report have been summarized based on the success factors for logistical integration:

- ***Enlist Top Management Support:*** There is no substitute for support from the top. This support involves more than just resource allocation, but also includes the guidance, approval, and internal functional buy-in for the changes required.
- ***Instill Cross-Organizational Vision and Trust:*** Success depends on partners that can work together to plan a common strategic vision and to create joint solutions when problems arise.
- ***Establish Cross-Functional and Cross-Enterprise Communication:*** Without frequent communication of objectives, goals, measurement, and changes, relationships will not operate efficiently. Communication encourages a true partnership to develop that bridges organizations and facilitates a trusting relationship.
- ***Promote Cross-Organizational Ownership and Decision-Making:*** Processes need to span functional lines within all companies involved. This cross-organizational approach creates integration “champions” within the partnering firms that facilitate new ideas, creative solutions and improvement processes. This approach also acknowledges that understanding total supply chain costs is critical. This means that traditional roles and responsibilities across the supply chain may need to be changed in order for total cost to be minimized.
- ***Apply Learning, Skills, and New Knowledge to Other Relationships:*** The benefits of ECR and supply chain integration are capitalized when they can be transferred to other relationships. This transformation enables economies of scale/scope to develop that create greater levels of efficiency and effectiveness.

- ***View Supply Chain Integration as a Long-Term Evolution:*** Change will not occur overnight. The tools and techniques highlighted throughout the report are too extensive to be implemented concurrently and immediately. It will take time to re-engineer the existing structures and build the necessary relationships in order to implement advanced applications of ECR and supply chain integration. Also, this approach acknowledges that short-term financial pressures are often contradictory to long-term growth and performance improvement. Sharing this evolution vision enables firms to see the benefits of long-term performance enhancements.
- ***Handle Product/Customer Bundles on an Order-by-Order Basis:*** Flexibility is key in today's rapidly changing environment. In spite of this, there must be a balance between flexibility and standardization in order to develop efficiencies. The supply chain that works successful in one partnering relationship may be completely different than the supply chain in another relationship. Merchandising, marketing, operations, and logistics capabilities and desires must all be considered in order for unique, yet efficient solutions to be created.

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- Mercer Management Consulting for their financial support of this research. We sincerely appreciate their generosity.
- The companies who agreed to participate in the research. Although their names will be kept confidential in this report, we sincerely wish to thank them and encourage them as they continue on their paths of improvement.
- The individual participants who shared their time, ideas, and experiences with us during the interview process. Your time and effort made the research process not only exciting, but also successful. We are grateful for your participation.
- Mr. Joseph Andraski for providing us with his time and insight while we were getting the research off the ground.
- Dr. Donald Bowersox and Dr. David Closs for their continued support and guidance.

SUPPLY CHAIN INTEGRATION IN THE FOOD AND CONSUMER GOODS INDUSTRIES

INTRODUCTION

Rapidly changing social, demographic, and technological forces are significantly altering traditional food and consumer goods supply chain structures. Evidence regarding the performance of firms engaged in these industries since the inception of Efficient Consumer Response (ECR) and other supply chain integration initiatives revealed that individual companies have achieved widely different operating results (*Supply Chain Management: Differentiating Through Effective Logistics*, Food Marketing Institute, 1999). Some firms showed significant financial improvement while others exhibited flat or declining financial performance. Wide variance in the supply chain strategies and structures used by individual firms was also found. Firms that adhered to operating and merchandising principles that responded to actual demand enjoyed significantly higher net profit margin, asset turnover, and return on assets as well as superior inventory performance in comparison to those who continued to follow traditional push strategies. Responsive supply chain operating principles resulted in financial gains or “free cash spin” that could be reinvested to counter growing competitive challenges.

The previously reported Food Marketing Institute (FMI) research provided some evidence that selected firms have achieved fundamental change in the way they operate based on integrated supply chain best practices. While many have espoused these principles, to date only a limited number of firms have been able to maneuver through the stages of application and implementation of these best practices. A large number of food and consumer goods enterprises continue to pursue strategies based upon the principles of forward buy and diversion. The purpose of this research is to explore the logistical strategies and structures used by selected food

and consumer goods firms to integrate their supply chains. It illustrates effective supply chain integration strategies and identifies critical success factors and barriers to successful implementation.

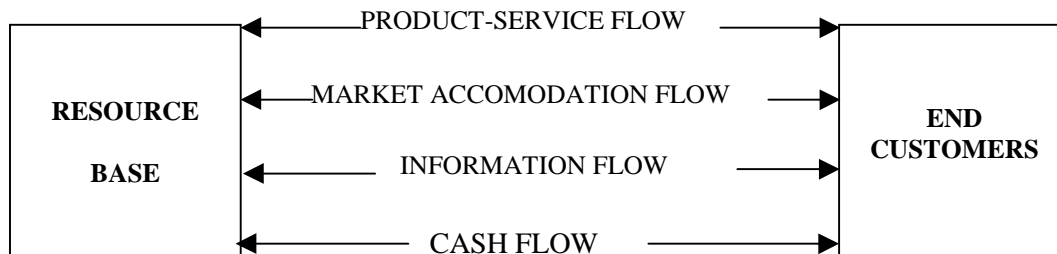
The research was accomplished through in-depth interviews conducted with managers from fifteen supplier/customer pairs representing food and consumer goods supply chains. The researchers, along with industry experts, identified and contacted managers involved in supply chain collaborations to solicit their participation. These managers identified partners from their customer and/or supply base to join them in the research. Twenty-nine different firms including twelve manufacturers, five distributors/service providers, twelve retailers, and three service providers participated. Field and telephone interviews were conducted with managers responsible for supply chain strategy, planning, and operations.

THE SUPPLY CHAIN 2000 FRAMEWORK

Ten years of research by Michigan State University has focused on identifying the logistics and supply chain competencies that the best firms worldwide utilize to achieve and maintain logistical excellence. A number of books and publications identify the distinctive qualities and competencies of superior logistics performers. The most recent, *21st Century Logistics: Making Supply Chain Management a Reality* (Council of Logistics Management, 1999), is a research-based narrative that describes essential supply chain competencies. The book supports the conclusion that leading logistical practice is generalizable across industries, along the supply chain, and across cultural boundaries. Most importantly, the research describes a framework that identifies the logistical competencies essential to linking resource suppliers

with end-customers. The framework, entitled Supply Chain 2000, depicts value creation as achieving synchronization and coordination across four critical supply chain flows. The flows are illustrated in Exhibit 1.

EXHIBIT 1
SUPPLY CHAIN FLOWS

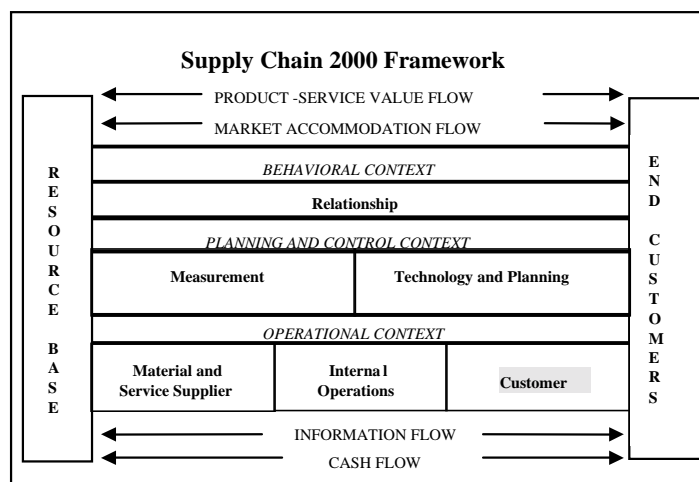


The first flow, product-service value, represents the value-added movement of products and services from the raw material provider to end-customers. Product value is increased through physical modification, packaging, market proximity, customization, service support, or other activities that enhance the desirability of the product from the viewpoint of end-customers. Market accommodation, the second flow, reflects post sales-service administration and reverse logistics, including product recalls and recycling. Market accommodation also provides all participants with supply chain visibility regarding timing and location of product consumption. Examples are product customization requirements, point-of-sale (POS) data, end-customer consumption, and warehouse releases. Third, information flow is the bi-directional exchange of transactional data and inventory status between supply chain partners. Typical examples are forecasts, purchase orders, order acknowledgements, shipping and inventory information, invoices, payments, and replenishment requirements. Information exchange initiates, controls, and records the product-service value flow and market accommodation flow. Fourth, cash flows in the reverse direction of value-added activities, although in situations involving promotions and

rebates cash may flow in the same direction as products and services. Cash flow velocity and asset utilization are of primary importance to superior logistics performance.

These four flows occur in all supply chains. When coordination and integration are lacking between supply chain participants, however, the results often are characterized by delay, redundancy and inefficiency. To improve flow across a supply chain, individual competencies related to operations, planning and control, and behavioral dimensions or contexts of supply chain management must be integrated. Exhibit 2 presents the total Supply Chain 2000 framework.

EXHIBIT 2 SUPPLY CHAIN 2000 FRAMEWORK



The Supply Chain 2000 framework identifies six highly visible competencies of supply chain logistics integration. A *competency* is the synthesis of selected logistical activities into a logically coherent and manageable state of affairs sufficient to gain and maintain supply chain collaborations with customers, internal activities, and suppliers. Firms that achieve a high level of integration across the six competencies are positioned to exploit logistics to gain and maintain

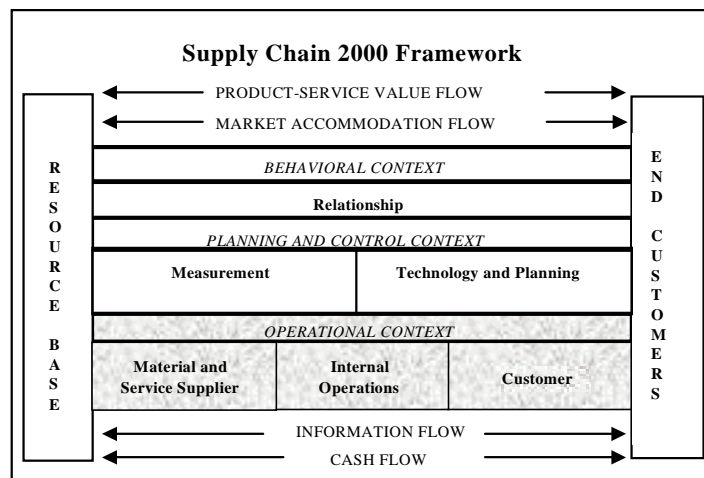
competitive advantage. The competencies are achieved within three dimensions of the supply chain: the operational context, the planning and control context, and the behavioral context.

Each of the Supply Chain 2000 framework contexts will be described in greater detail in the next section. Examples from the research will be used to demonstrate how some firms are successfully integrating supply chain logistics within each context.

INTEGRATION CONCEPTS AND TECHNIQUES

The twenty-nine firms interviewed for this research compete in many different environments and operate under various business models. Each, however, has been able to implement concepts and techniques that contribute to integration within one or more of the contexts of the Supply Chain 2000 framework. In this section, examples of supply chain integration that best represent the intent of the framework will be featured.

THE OPERATIONAL CONTEXT



The operational context reflects the most fundamental level of analysis in the supply chain. It is here that the work of logistics takes place. While activities that take place in other contexts determine *what* work is done, *how* the work will be done, by *whom*, and the *priority* of that work, it is at the operational level that end-customers are ultimately satisfied and the majority of the costs of delivering service are incurred. The operational context integrates internal order fulfillment and replenishment processes with work performed by material and service providers and the distribution networks responsible for delivering products to customers.

Internal Integration

Internal integration focuses on the activities and processes within a firm that coordinate procurement, operations, and customer fulfillment. Firms have attempted to integrate internal processes for a substantial period of time. Many managers, however, strongly suggest that there are still significant gaps between the desired and actual state of internal integration. Logistics managers often report more success in coordinating with customers than with their own purchasing and manufacturing operations. In turn, buyers frequently perceive they have better integration with suppliers than with their own manufacturing, logistical and marketing operations.

The existence of operational separation is sufficiently common to highlight the importance of closing what has come to be referred to as the Great Operating Divide. In most firms, there has been a lack of a balanced approach regarding the performance of integrated operations. Internal logistics integration links sourcing, production, and replenishment into a seamless process capable of supporting end-customer requirements. The goal is high-level basic service at the lowest total cost.

Among the many concepts and techniques employed to coordinate internal operations, the following three stand out as having been frequently observed among the research participants:

- ☐ Simplification
- ☐ Consolidation
- ☐ Internal “buy-in”

Simplification reduces complexity in day-to-day order cycle execution and ongoing planning and analysis. One way to reduce complexity is to place an upper limit on the number of products that the firm is willing to maintain at any point in time. Several of the retailers we interviewed commented that they frequently implement shelving policies that require manufacturers to drop one SKU before adding a new one to their existing array of product offerings. Simplification is also achieved by pursuing an exception basis to managing operations. The widespread adoption of information technologies has resulted in significant improvements in the ability to manage work. One adverse effect, however, is the onslaught of “information overload.” Therefore, identifying value-laden information and formatting such information so that exceptions and problems can immediately be identified is critical. Moreover, a firm should be made aware of problems, as they occur, that affect their most important customers. Several of the interview firms are seeking this level of operational visibility to ensure near-perfect logistics execution.

Closely related to simplification is the effort to consolidate. Consolidation initiatives are commonly sought to reduce complexity, improve economies of scale, and reduce costs. For example, the consolidation of a firm’s facilities improves the utilization of existing sites, eliminates redundant activities, and lowers per unit handling and storage costs. Consolidation across business units allows the firm to more fully leverage its buying power for material, product and service purchases. Consolidation is also being applied in SKU management.

Several of the retailers reported that slow moving and difficult-to-handle products, as well as key promotional products, demand too much managerial and financial resources to manage on an individual basis. Pooling these product types (or completely eliminating them when possible) into SKU segments managed separately from other, less complicated goods offers potential for cost and complexity minimization.

Equally, significant to the success of all internal integration efforts is gaining effective internal “buy-in” among the firm's functional and support area personnel. The research participants achieved buy-in several ways. Tracking actual performance was found to be the best way to garner support from the various stakeholders in the firm. Accurate measurement of firm performance and costs is critical to effectively determine whether the firm’s objectives are achieved at the least total cost. Managerial rewards and compensation are closely tied to shifting responsibilities within the firm and the close measurement of costs and performance. More specifically, when the objective of the firm shifts from functional excellence to organization-wide excellence, traditional bases of rewards must shift from functional success to contributions toward organization success. Counter to tradition, one food retailer reported issuing rewards for achieving specific levels of service that actually caused lower throughput and higher per-unit functional costs. These were acceptable because they contributed to lower overall costs.

One method for achieving buy-in across multiple functions is to allow an independent part of the organization to measure and report actual performance and improvement opportunities. In several organizations, the finance area has responsibility for measuring cost and verifying actual savings generated by procurement and logistics. This makes the numbers more believable and less threatening for other functional managers.

While simplification, consolidation and effective buy-in are common pursuits of internal integration, the research also identified unique methods of improved internal coordination. Such coordination is particularly challenging with regard to cross-functional efforts. For example, many firms are familiar with the dysfunctional relationship between logistics and the sales force. Logistics feels that salespeople are “always making promises to customers” that the logistics group could never hope to meet while the sales reps claim that the logistics people “can never get their collective act together” to help the sales department satisfy its customers. One food manufacturer participating in the research offered a unique proposal: manage the salesperson as an individual profit center. The logic is that the salesperson is held accountable for the promises he/she makes to customers as well as the avoidable costs of providing the promised service. Thus the firm tracks the sales of the individual representatives but also the additional costs of expedited production, expedited movement and unique services. As long as the salesperson yields a profit on these challenging accounts, all is fine. But when the costs of fulfilling such orders narrows margins to an unreasonable level, the sales person is held accountable. Clearly, bringing the costs of serving a customer into consideration dramatically changes the traditional revenue-focused motivation of the salesperson.

External (Customer and Material/Service Supplier) Integration

External integration is the practice of linking operations with fellow supply chain members. External integration occurs both with customers and with the material and service providers of a firm. Effective integration occurs through coordinated efforts with customers and suppliers to create a seamless, synchronized supply chain equipped to more effectively respond to end-customer demand at the least total cost. Tradeoffs occur among supply chain members so

that the desired level of customer service is also rendered. These tradeoffs require that supply chain members to share risks and rewards.

Managing tradeoffs while sharing risks and rewards of cooperative efforts calls for creative solutions to the cost-to-service challenge. Rather than pursuing traditional adversarial, win-lose relations with suppliers and customers, win-win outcomes are sought to achieve long-term gains for entire supply chains. Reaching these creative solutions proved to be the greatest challenge to the firms examined.

Several broad categories of effective external integration emerged from the interviews. These include:

- ☐ Conformance to a uniform set of objectives
- ☐ Cooperative planning designed to meet objectives
- ☐ Consistent performance measurement to assess progress
- ☐ Compensation mechanisms that reward overall system success

An absolute requirement for external integration is establishing and sharing uniform objectives. Mutual objectives serve to guide relationship management. All firms involved must help to design and subscribe to the objectives. It is imperative that service providers share common objectives with shippers/customers in an effort to enhance the positive outcomes associated with successful efforts to externally integrate. Some consumer goods manufacturers, for example, have given complete responsibility for customer order fulfillment to select logistical service providers or third party logistics firm (3PL) partners. These 3PLs serve as manufacturer representatives to customers by resolving operational and strategic issues in the field. 3PLs disciplined to help supply chains meet common objectives can serve as key facilitators of external integration.

3PL's face problems when required to perform contrary to their own objectives. Conflict may surface, for instance, when the 3PL is asked to manage inventory for a shipper. Shippers seek perfect order fulfillment with minimal inventories, while 3PLs are likely compensated more conventionally based on product storage and movement over a time period. As a result, the 3PL is motivated to maintain inventory levels beyond that necessary for efficient and cost effective customer service. The 3PL's short-run pursuit of maximum storage and handling revenue impairs the shipper's value.

Once common objectives are established, ongoing cooperative planning is required among supply chain members. Most partnerships examined in the research had mechanisms in place for frequent, formal planning communication. Successful planning efforts require cross-enterprise cost-to-cost tradeoffs, alignment of networks and facilities, and information sharing regarding new products and promotional strategies. Monthly or more frequent interaction among organizational leaders of shippers, service providers, and customers was a common characteristic of planning efforts. Without support from merchandising, marketing and sales, customer service, supply chain planning, warehousing, distribution, production, and purchasing, initiatives to integrate fail to receive the priority necessary to gain the support of primary stakeholders. Research participants reported that establishing the high levels of inter-organizational commitment necessary for successful integration required years of inter-personal and business-to-business interaction.

Several of the manufacturers and distributors interviewed relied on cooperative planning to improve forecasting, order and returns processing, and equipment and facility utilization. Reducing waiting time at shipping and receiving docks also drew considerable cooperative

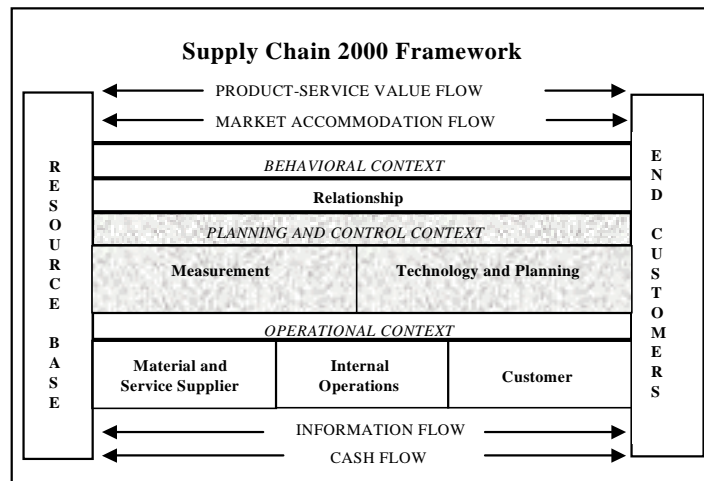
attention. Some shippers identified narrow delivery windows and engaged in planning activities to ensure adherence to these commitments.

Continuous planning efforts result in tailored solutions that best meet the changing needs of entire supply chains. Tailored solutions take the place of a traditional “one-size-fits-all” mentality, whereby many firms are designing individual supply chains to meet the unique needs of specific customers without losing economies of scale. The challenge becomes one of trading costs and services to achieve the best mix to satisfy key customers.

Once objectives are determined and plans are in place, continuous measurement is necessary to assess performance. Traditional functional measurements (e.g., on-time delivery, transit time, order fill rate, equipment utilization, and unit purchase price) alone are insufficient for integrative supply chain analysis. Metrics that assess inter-organizational and system-wide performance are necessary to evaluate the success of all supply chain partners in achieving cross-enterprise service and cost objectives.

Appropriate compensation to reward success throughout the system also is important for fostering external integration. To produce effective behaviors, compensation must directly link objectives with desired goals. Reward systems must be geared to system-wide performance outcomes. One 3PL that performed multi-vendor/multi-retailer consolidation exemplified an innovative compensation system. After jointly determining the activity-based costs of operations before and after the 3PL’s consolidation effort, compensation was based upon the savings the 3PL generated for manufacturers and retailers. As the 3PL helped to reduce waste and cost, its earnings were increased. The 3PL received compensation for and thus was motivated to pursue outcomes that benefited the entire supply chain.

THE PLANNING AND CONTROL CONTEXT



Across the supply chain, information technology and measurement systems must facilitate planning and control of integrated operations. Operating excellence must be supplemented and supported by integrated planning and measurement capabilities. Integration in the planning and control context refers to the design, application, and coordination of information technology and measurement systems to facilitate, monitor, and control the performance of purchasing, manufacturing, customer order fulfillment, and resource planning.

Technology and Planning Integration

Integrated management requires high-quality information to support the wide variety of operational configurations needed to serve diverse market segments. Effective planning and operations requires thorough, accurate, and timely information from customers, material and service suppliers, and internal functional areas regarding current and expected conditions. Only an integrated information system can provide the input needed for short-, mid-, and long-term plans that translate strategic goals and objectives into action and work to guide each operating

area. This includes access to databases and applications that enable sharing of appropriate information and integrated decision-making among supply chain participants. The task is complicated since the systems must increasingly support global flows of product, cash, and information.

A wide variety of approaches exist to provide technology and planning integration. The selected approach depends on the internal and external level of integration that currently exists. For companies just beginning to integrate, the initial stages tend to focus on internal planning issues as they are easily identified. Firms that have already begun to integrate internal planning systems often focus on adding technology to improve supply chain performance.

One sample firm that had not yet invested heavily in information technology applications, for example, chose to initiate internal planning. The company established cross-functional, supply chain management teams consisting of a person from sales/marketing, logistics, and customer service. Reorganization went beyond establishing a cross-functional team and included establishing key accounts and creating team-based performance measures. Traditional sales and marketing bonus structures based on volume were replaced as entire teams were compensated for reaching common goals leading to increased performance and account satisfaction. Measures included in-stock performance, on-time delivery, lead-time, fill rate, and customer satisfaction. Although these measures reflected traditional performance elements for logisticians, they were radically new concepts for marketing and sales representatives.

Once companies have developed more comprehensive internal planning capabilities, they can rely on technology to further supply chain integration. Two examples of advanced technology and planning approaches revealed in this research include:

- ❑ Scan-based trading (SBT)

❑ Collaborative planning, forecasting and replenishment (CPFR)

Scan-based trading occurs when a manufacturer (or 3PL) handles the replenishment portion at store shelf and “consigns” inventory to a retailer. This consignment means that the retailer does not pay for the inventory until it is actually purchased by the consumer at point-of-sale (POS). Two main changes in mindset are required for scan-based trading to operate successfully. First, retailers must be willing to allow product to enter stores without the backroom check-in traditionally required. Manufacturers deliver product directly to the store shelf bypassing delays due to store receiving schedules and labor availability. Manufacturers are better positioned to re-stock shelves at times productive for its labor utilization and based on actual product replenishment needs. For example, a chocolate manufacturer could choose to deliver product in the late evening/early morning hours when temperatures are cooler. The need for refrigeration units is reduced as mid-day heat is eliminated, thus delivery is less expensive. Less-than-fresh product often resulting from melting and refreezing is also reduced.

In another example, based on the product type and consumer demand fluctuation, it may be best for the manufacturer to deliver more frequently (e.g., twice per week or daily) than the weekly delivery common with more traditional replenishment systems. More frequent delivery of bakery products, for example, helps to ensure that consumers receive the freshest product, which improves the quality delivered by the manufacturer and results in more satisfied consumers for the retailer. Also, since consumer traffic in the stores varies, scan-based trading enables better in-stock performance. If a weekly delivery date is set for Tuesday, the manufacturer’s product may be out-of-stock by Saturday or Sunday. Stores are often reluctant to receive weekend shipments or to have in-store labor restock shelves during weekends. In a scan-

based environment, the manufacturer can deliver product and merchandise the shelf on a Friday evening or Saturday morning to ensure in-stock performance is at its highest for weekend traffic.

Benefits of bypassing backroom retail receiving include improved in-stock performance, higher quality products, and more attractive merchandising without the use of in-store labor and stockroom needs. In-stock performance and quality product offerings are clear benefits to manufacturers, retailers, and consumers as these outcomes lead to improved customer service, higher sales volumes, and store loyalty. Delivery services recognize better driving conditions and less congestion during off-peak hours leading to more productive delivery route. Also, a reduction of in-store labor is beneficial, particularly as wage rates continue to escalate as low unemployment rates induce labor turnover. In many cases not all products are conducive for scan-based trading, therefore, retailers may have two receiving processes: a traditional back-room approach and a scan-based process.

Payment processes may also require rethinking to make scan-based trading successful. Manufacturers and retailers must synchronize their exchange of real-time data, including price changes, promotional allowances, and item maintenance. POS scanning must be accurate at the store-level and inventory accuracy is required of manufacturers. Retailers benefit from improved cash flow by delaying payment until the product actually sells. Manufacturers benefit by using daily POS data to replenish to actual demand as opposed to forecasted demand.

The basic philosophy behind CPFR is to merge two successful concepts – category management and supply chain management – via technology and planning techniques to improve overall supply chain performance. This planning and control integration allows manufacturers and retailers to concentrate on improving sales, reducing waste and inefficiencies in the system, eliminating duplicate work activities, and improving financial performance. The benefits of

CPFR include increased category sales and service levels, reduced inventory levels and shrinkage, improved forecast accuracy, enhanced case-fill performance, increased profit, and fewer forecast changes. These benefits affect both the manufacturer and retailer.

CPFR begins with parties working together to develop a market-specific plan using category management techniques that drive product selection, pricing and promotion activities. The plan uses POS data to determine daily/weekly delivery and replenishment actions (i.e., short-term goals) and also focuses on promotional programs and new product development plans six months out or longer (i.e., long-term goals).

One research participant using CPFR focused specifically on creating joint marketing plans and sales/order forecasts. Planning meetings were held on a quarterly basis to develop item-level sales forecasts and marketing plans projecting thirteen to fifteen weeks advanced. Planning processes began by selecting a product category. Secondly, the parties compared internal marketing plans for the category, reviewed past sales and promotional history, and jointly created a merchandising plan. From this merchandising plan, item-level forecasts were created on a rolling thirteen-week period. Forecasts were locked in or “frozen” three to five weeks in advance to assist the manufacturer in setting a production and delivery schedule.

Successful CPFR requires cross-functional representation, training, senior management support, and a high level of communication. Creating cross-functional teams that include planning, marketing/sales, customer service, logistics, production, and purchasing representatives from manufacturers and retailers is critically important in developing plans and forecasts. Oftentimes, forecasts and plans are inaccurate because planners must make guesses concerning information of which another party in the supply chain may have access to more concrete data. Cross-functional teams ensure that total information is shared throughout the horizontal pipeline.

Significant training may be necessary for cross-functional teams to understand the implementation of CPFR, how to create the category merchandising and order/forecasting plans, and how to develop process maps that enable waste and inefficiency reductions. Often companies consider hiring consultants to assist training and re-engineering efforts. Senior management support of the CPFR process is imperative for teams to have the training, time, and resources necessary to plan and implement CPFR.

Lastly, CPFR requires communication. Various research participants in the implementation stages of CPFR indicated that sophisticated technology was not an initial primary concern. Through face-to-face planning meetings, faxing daily sales information, and emailing spreadsheets of sales, ordering, and promotional information, CPFR can be pursued. Under such conditions, significant human interaction is necessary to ensure the accuracy and efficiency in the process. Other participants discussed how useful advanced technology was to the success of CPFR. Technology included EDI transaction sets to manage the ordering and price change process to the use of collaborative software allowing data to be imported and exported into a supply chain system via the Internet. Sometimes software was managed through a third party agent to protect each party's secure system.

Research participants identified the need for better technical integration to facilitate communication and improve accuracy. One of the key barriers to successful implementation of CPFR continues to be lack of communication across two different, stand-alone information systems – even when collaborative software is used. A system that incorporates the CPFR team forecast into the manufacturer's sales system and downloads the information into a DRP or MRP system to drive manufacturing production is needed.

The participants also noted that technology investment is not a stand-alone solution. The human element remains important. Although technology can enhance integration and provide significant performance improvements, it will only help companies encounter problems sooner if it is not accompanied by process revision. One manager remarked that automating antiquated processes merely speeds them up – it does not improve financial or service performance. Performance improvement comes from technology that facilitates and improves decision processes by enabling managers to eliminate redundant and non-value added tasks, freeing time for activities that create value.

Measurement Integration

Creating competitive advantage through high performance logistics and supply chain capabilities requires integrated measurement systems. These systems must track the performance of operations across the borders of internal functional areas and external supply chain partners. Measurement systems must also reflect the operational performance of the overall supply chain and the financial performance of individual firms. Integrated performance measurement provides the basis for calibrating the many parts of the supply chain engine. Good metrics and strong measurement systems serve to provide timely feedback, so management can take corrective action, and drive superior results.

Managers frequently are frustrated by the inability of traditional measurement systems to monitor logistical processes that extend across functional and firm boundaries. There are four primary reasons for this frustration. First, existing measures tend to place too much emphasis on internal performance objectives/targets. Second, existing measures tend to focus on performance

within functional boundaries. Third, existing measures do not capture cross-organizational performance. Fourth, existing measures do not have a clear end-customer focus.

Significant effort and resources have been devoted to developing detailed performance measures for each of the key functional management areas (e.g., procurement, manufacturing, logistics, sales/marketing). These measures permit managers to track internal performance against targets/standards and to make decisions designed to drive improved overall functional performance. The synergies that exist within and between functions, however, are generally not captured through these limited-scope measures. Moreover, the ability to identify trade-offs between the functions is made more difficult by these same fragmented measures. Budget allocation processes based on functional performance objectives and compensation systems reward behaviors that are not in the best interest of the organization.

In a multi-organizational supply chain context, the problems caused by inadequate performance measurement systems are even more significant. Planning and control processes in a supply chain context require measures with the proper scope and focus. For example, one research participant completed a comprehensive review of its existing performance measures, with the objective of establishing a single set of supply chain performance indicators that could be used across multiple organizations. After significant debate, this organization determined that on-time delivery was not a relevant performance measure in the supply chain context. Instead, the organization chose to focus on in-stock performance at the retail shelf. In-stock performance places the emphasis on end-customer availability, whereas on-time delivery is focused on meeting a pre-established delivery date to the next destination in the supply chain. This is not to suggest that on-time delivery is unimportant. Rather, this company found that expediting costs to meet on-time delivery performance objectives within the supply chain were wasteful in light of

existing inventory levels throughout the supply chain. Moreover, these expediting costs were not providing any tangible value for the end-customer (i.e., in-stock performance was low even when on-time delivery performance was high).

Similarly, this company instituted a measure of total system inventory, which measured raw material, work-in-process and finished goods inventory at all locations throughout the entire supply chain. Again, the company found that its existing inventory measures, which focused on inventory reduction, did not capture increases in inventory elsewhere in the supply chain. The new measure of total system inventory permitted all organizations in the supply chain to focus on a single improvement objective that brings tangible value to the end-customer.

Unfortunately, it is much easier to suggest that performance measures need to change than to make that change a reality. Like the other integration areas, measurement integration requires creation of a vision, followed by small, focused changes designed to bring different measurement approaches and philosophies into alignment. To achieve this level of change, some organizations have begun to offer incentives to other organizations in order to drive the changes necessary to achieve improved supply chain performance. This incentive-based approach has also been used to drive internal change.

One 3PL, for instance, instituted an activity-based costing approach that carefully delineated the actual costs attributable to various activities. Using this detailed performance information, the third-party was able to provide evidence of potential cost-savings for both manufacturers and retailers through use of its consolidation services. For retailers, cost savings alone were not enough. The need for improved in-stock performance at the retail shelf was more important. Consequently, the third-party established improved in-stock performance as a key element of its strategy. By focusing on the unique needs/benefits of the individual members of

the supply chain, the third party was able to secure the desired changes. The result was not only improved performance, but also a platform of success from which further joint changes could be evaluated and ultimately implemented.

In another instance, a distributor wanted to change its pricing philosophy from “one price fits all” to a menu-based pricing approach. In order to support this menu-based approach, the distributor needed the manufacturer to provide a breakout of post-production cost components. In order to secure this information, the distributor needed to establish the potential joint benefit that would prompt the manufacturer to provide this information. The distributor identified several areas of potential cost savings to the manufacturer, but indicated that it needed post-production cost components to establish the best options. The information was eventually provided, allowing the distributor to select services that resulted in the most efficient cost for both the manufacturer and distributor.

A key feature of incentive programs is establishing proof that performance improvements will provide two-sided benefits. Many companies take the position of “Show me the money.” Until an organization can establish clear benefits to change, few other organizations will invest in the time and resources necessary to make change a reality.

Another approach used by many organizations to help make the measurement process more representative of shared operations is performance scorecards. One retailer’s scorecard included the following key elements:

- ☐ In-stock performance (retail shelf)
- ☐ Inventory (in-store and distribution center)
- ☐ Inventory turns
- ☐ Average dollar investment
- ☐ Top-line sales growth
- ☐ Gross margin

In addition, this retailer evaluated on-time delivery, quality and fill-rates, although these measures received less emphasis and were only discussed when problems arose. Another scorecard used by a manufacturer and retailer included the following key elements:

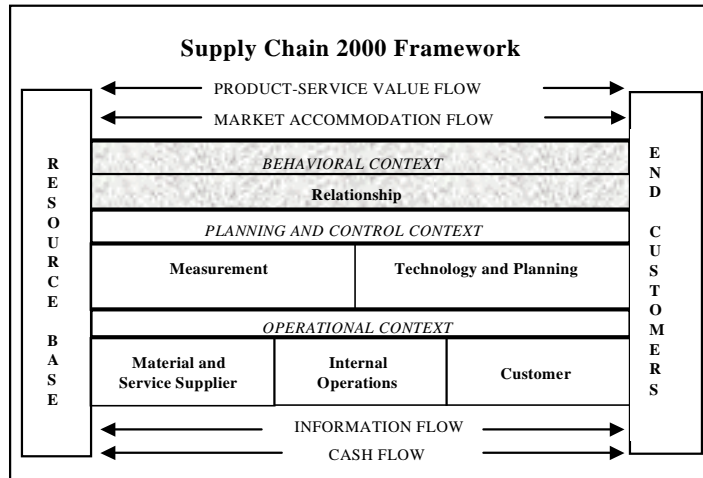
- ☐ Volume
- ☐ Customer service
- ☐ Emergency orders
- ☐ Percentage of full pallets
- ☐ Number of direct plant shipments
- ☐ Truck utilization
- ☐ Average deductions
- ☐ OSD pallets
- ☐ Late charges
- ☐ Promotional effectiveness

Each of the performance scorecards is heavily weighted with factors that are important to the company managing the scorecard process. This bias remains a common threat to improved supply chain performance. By focusing on considerations that are important to only one entity in the supply chain, companies are unable to recognize and capitalize on the benefits that come from the fusion of unique capabilities. Understanding the economics of the total supply chain is critical, if supply chains are really going to compete with other supply chains.

Existing measurement processes remain a significant barrier to enhanced supply chain relationships. In order to support effective supply chain relationships, the experience of the research participants suggests that measurement integration requires:

- ☐ Cross-functional, multi-organizational measurement vision
- ☐ Accurate performance data shared regularly across all members of the supply chain
- ☐ Multiple, cascading measures that capture cross-functional and multi-organizational performance of supply chain processes
- ☐ Performance measures aligned with internal budget allocation processes and internal and external reward structures
- ☐ Focus on provision of end-customer value

THE BEHAVIORAL CONTEXT



Effective relationship management is essential to optimize supply chain planning and control and operations, and relies on the strength of the business relationship between supply chain partners. The behavioral context is concerned with the process of developing effective, long-term collaborative relationships; in particular, how they should be designed and implemented, who should be involved and direct such efforts, which areas of partner firms require involvement, and what communication structures are necessary.

Relationship Integration

Relationship integration addresses the behavioral attitudes that firms need to instill if coordinated operations and strategies are to be developed and sustained. There must be a shared vision and shared objectives among customers and suppliers about interdependency and principles of collaboration. Efforts must focus on providing the best end-customer value regardless of where along the supply chain the necessary competencies exist. This collaborative perspective is the key to long-term supply chain viability. In order to pursue a competitive

advantage, effective supply chain structures must be created to align the functional operations of multiple firms into an integrated system focused on satisfying end-customers. Relationship integration requires willingness on the part of supply chain partners to create structures, frameworks, and metrics that encourage cross-organizational behavior. This includes selecting appropriate partners for integrative relationships, approaches to initiating relationships, developing common vision and mutual understanding of goals, and communications.

Long-term and highly intimate relationships require extensive investment of time and effort to properly develop and receive benefit. Firms must be selective, therefore, when choosing potential partners. Many of the research participants indicated that they engaged in significant relationship development with only a few critical partners. Most defined critical or principal partners as those providing the most significant supply volume. One firm explained that they had only selected 12 suppliers, out of a supply base of more than 250, with which to develop such ties. Even then, those selected were at varying stages of relationship development. A large retailer implementing vendor-managed inventory (VMI) focused on their largest vendors of commodity-like products. Only 30 percent of their vendors could be considered for the program.

Some firms identify critical partners based on their strategic importance and the degree of innovation used in their operational processes. A consumer goods manufacturer, for example, formed a close relationship with a small retailer known for its creative and flexible operations. The manufacturer gained value from the retailer's knowledge of vendor-managed costing programs. In return, the small retailer benefited from being considered a key customer from a service and prestige perspective.

The research revealed two clear approaches for initiating relationship integration once appropriate partners were identified. Instances of both top-down approach and of bottom-up approaches were found. One partnership, for example, began at the operational level. As one partner said, “People are curious and are looking for ways to improve efficiencies. As you go through low-level research, you reach a point where you need corporate sponsorship to start moving forward.” From this perspective, relationship integration began with investigations of process improvements by operational managers workers. As ideas developed, more frequent meetings were held to better frame the propositions. Over time, personnel from other areas, for example buyers, were brought into discussions. From this point, further partnership integration required the support of corporate executives.

For some firms, relationship integration initiatives began at the president, vice president, and director levels. The president at one firm assigned three executives as liaisons to critical customers in an effort to encourage high-level support for relationship integration. The reason behind such structure was that functional managers of purchasing and transportation were more resistant to change than were top managers. The partner firm also found difficulty achieving buy-in from functional area managers. They, too, assigned a corporate director to manage the resources in directing the relationship objective.

Other relationships are initiated from the bottom up. For example, one partnership in this research developed when two key mid-level managers of a supplier and a buyer recognized the need for stronger relationship integration and coordination and began informal testing of their ideas. The relationship between the firms’ co-workers grew as they shared and began to analyze important data. Faster communication was their next objective and they developed a web spreadsheet that fit their needs. Small “successes” in their planning lead to the involvement of

more people in the system. Once the managers were able to illustrate substantial improvements, a formal proposal was drafted and ultimate executive level approval followed. This situation exemplifies the need for firms to have employees at all levels who are willing to work together for mutual benefit. This willingness runs counter to the traditional approach of customers requiring the concession of suppliers to affect significant change in strategic and operational behavior.

While it seems as though firms may employ either a bottom-up or top-down approach to initiating relationship integration, some commonalities among all firms were evident. Strong leadership was indicated as key to ongoing long-term relationship integration. Strong leadership involvement provides an indication that the relationship is not simply “business as usual.” This helps signal a change in focus and expectations for internal and external managers. One research participant, for example, held a partnership retreat that brought key members of both organizations together in a collaborative environment.

Agreement that integration must eventually spread through all levels of the firm regardless of the initial approach was another common trait of integrative relationships. Two partners explained that traditionally the primary connection between their firms was the sales person and buyer. When situations arose needing input from marketing, logistics, or functional areas other than sales, the sales person would have to go to managers from that area to obtain the critical information for the buyer. The buyer would then disseminate the feedback to the necessary people in their organization. The managers commented that this is not a very accurate or expedient method by which to communicate. Instead, advanced communication was achieved by interfacing account executives and buyers, as well as by pairing personnel from each functional area of both firms. The areas most critical to the success of the relationship included

supply chain, customer service, warehousing, distribution, purchasing, sales and merchandising, accounting, e-commerce, properties, legal, and human resources.

A mutual understanding between customers and suppliers with respect to the goals of the relationship and the level of interdependency is vital to achieving relationship integration. The belief that developing cooperative supply chain relationships result in greater value for the ultimate customer and long-term market superiority is key to relationship success. Yet few guidelines exist to help develop healthy and productive supply chain relationships, as no two situations are identical. Firms seeking strong relationship integration first establish a common vision of the structures and processes that currently link them. Next, the participants must assess the mutual value of the existing structures and processes. One supplier and customer indicated that they had to move beyond the traditional adversarial buying and selling structure that they had practiced for many years. This was not an easy step and took years to develop the trust needed to agree upon mutual agendas. Even then, the firms reported, some employees continued to believe that the relationship was solely governed by the buyer's agenda.

Communications structures are important to developing integrative relationships. During the initial relationship development stages, most research participants indicated the need for formal daily, weekly and monthly meetings between specific personnel levels to discuss goals and accomplishments. As the relationships matured, however, communication occurred less formally. As one retail participant stated, "Initially the partnership began with frequent meetings, but eventually the buyers realized the benefits and the formal meetings dropped off." For some, a scorecard approach replaced frequent formalized meetings and was used to indicate successes and areas in need of further refinement. Most participants, however, continued to hold quarterly

meetings where representatives from all areas of the partnering firms could gather to discuss issues and project future situations.

Partners must work to develop the trust necessary to share critical information that traditionally is considered proprietary. The focus of such data exchange is to identify opportunities to extract non-value-added work, such as minimizing information on invoices and eliminating certain transactions. One retail participant, for example, identified item counting as an area of redundancy in transactions with a particular vendor. The manufacturer counted items in an order prior to loading and shipping, the carrier moving the load counted the item prior to delivery, and the retailer recounted once items were received at a distribution center. All partners agreed to count the items only upon receipt at the retail distribution center. Billing and invoicing were based upon this count, and the manufacturer and carrier agreed to trust it. Periodic cycle counts at the retail distribution center provided a check for the accuracy of this “trust.” Another example of an outcome of this process assessment was the development of a menu-based service program in which partnering suppliers assessed costs on an as needed basis rather than forcing a “one price fits all” strategy on all customers.

BARRIERS TO INTEGRATION

The examples of integration presented in the previous sections have resulted in impressive improvements in firms’ abilities to better serve select customers at lower total costs. Yet these initiatives did not occur overnight. In each case the managers involved had to maneuver through a number of barriers encountered during the change process. To some degree the barriers were common across all the observed relationships. Prior knowledge of the barriers

will help managers better navigate change along the way toward implementing integrated logistical supply chain principles.

Gaining cross-functional and internal “buy-in”: One of the most prevalent barriers to supply chain change comes from failure to gain “buy-in” from other internal functional areas. Managers who propose logistical change are accustomed to embracing new ways to improve the value created by their firm. The same cannot be said of all managers. Unfortunately, logistical change often involves processes that require communications and coordination across functional boundaries. The “Catch 22” of implementing these innovations is that benefits cannot be realized unless managers from all areas agree to participate, and many will not commit unless they can be shown the tangible benefits of participating. Our interviews support this assertion.

The research disclosed several cases of managers struggling to get other functional areas to participate in change implementation. In one example, discussions about implementing a VMI relationship were delayed due to resistance from merchandiser and distribution center managers. Retail merchandisers representing a mass merchant of consumer goods did not like to discuss inventory reduction. They perceived this to be a criticism of their job performance. Similarly, distribution center managers denied that problems existed with stock availability and delivery time. Roadblocks such as these impair initiatives to integrate and must be overcome for progress to be achieved.

Performance measures, reward structures, and budget allocation processes are not aligned: In many cases, supply chain performance measures continue to be functionally focused (e.g., procurement vs. manufacturing vs. logistics). Where measures are process-oriented, they tend to

be narrowly focused on either downstream demand or on upstream supply. Measurement is frequently segmented into internal versus external processes.

Individual reward structures and incentives typically are not tied to overall supply chain performance. Sales forces, for example, continue to be rewarded on revenue growth even if that growth is unprofitable. Similarly, operations are often rewarded based on productivity even when the volume being produced has no market value. This situation was exemplified in one of the interview firms. Traditionally, the firm rewarded marketing for overall sales growth and logistics for in-stock performance. The evaluation and compensation systems encouraged marketing managers to push broad product assortments down the supply chain using price deals rather than develop focused solutions relevant to the specific needs of key customers. Products were often oversold even when information was available indicating that the total amount of stock on-hand would not cover sales. Back-orders resulted in satisfactory sales performance but poor logistical performance and angry customers.

One retail firm's measurement of on-time delivery provides an example of conflicting functional evaluations. The process started when the firm's buyers established a required delivery date (RDD). Receiving departments, however, often scheduled carrier appointments that exceeded the original RDD. In such instances, carriers *officially* missed the RDD, but provided the service desired by the receiving group. While buyers set original RDDs based on customer requests, the receiving groups often had legitimate reasons for scheduling delivery appointments beyond that originally requested. For example, the receiving department may have known that enough stock of a particular product was on hand to complete immediate orders. Consequently it was prudent to receive more critical deliveries first. This discord exemplifies the fact that performance measures must incorporate the directions of both buyers and receivers. In

another firm, the key supply chain performance measure was cost of goods sold. Unfortunately, the sales force was not evaluated on this performance measure even though sales initiatives had a significant impact on cost of goods sold through promotional plans, discounts and deals. This created a tremendous internal barrier to change.

Other performance problems emerge when internal budget allocation processes that determine project-funding priorities are not aligned with supply chain realities. This typically occurs when cost reduction or market growth initiatives are chosen over other endeavors that are more aligned with overall company or supply chain objectives. One vendor, for example, had a raw material supplier that suggested moving a cleaning process from the supplier's facility to the vendor's facility. The supplier indicated that the move would improve performance, significantly reduce cost, and enhance the vendor's ability to monitor and manage a process with significant health implications. The move would have required the vendor to make a capital outlay of \$30,000. Although the \$30,000 was small in comparison to potential savings, the vendor was operating under a corporate mandate to reduce asset investment. Consequently, the move was not made and an opportunity to enhance performance was not made.

As we move into an era where supply chain performance requirements are increasingly scrutinized, e.g., forcing procurement to commit to \$3 billion cost reductions over three years, it will be harder and harder to make these types of trade-offs within current organizational structures. Change will require firms to determine what objectives are most important and how best to measure, control, and reward actions directed toward achieving them.

Reward programs encourage a short-term performance focus: As companies try to link supply chain performance to the bottom-line financial health of the organization, increasing pressure is

placed on immediate returns. Unfortunately, it takes time for the financial returns associated with cross-organizational supply chain trade-offs to develop. One firm ensures that long-term programs are not sacrificed due to short-term financial performance pressures by maintaining a portfolio of active initiatives.

Reward and compensation problems are even more acute when company borders are crossed. This is particularly noticeable when comprehensive logistics activities are outsourced to 3PLs that manage inventory in their own warehousing facilities and control transportation movements for the shipper. Compensation may be on a simple volume basis. The more products handled, the more the shipper pays the 3PL. This method works well as long as inventory turn is high. Marketing pressure to provide high levels of product availability, however, often encourages the 3PL to hold excess inventory. The wrong result – carrying excessive inventories - is rewarded. This merely shifts inventory from one supply chain entity to another and fails to reduce total cost. Ultimately, the shipper becomes disgruntled with higher costs due to excess inventory and, perhaps, poorer service due to inadequate information sharing and terminates the relationship.

Commingled product requirements challenge operations: Traditional logistics operations between vendors and retailers are geared toward moving large volumes of palletized product. Integrative techniques, however, often require consolidated movements of large product assortments in relatively small volumes. This requirement places new demands on logistics operations. One challenge a sample firm encountered was determining the best way to load a full truck with two or more products with different physical characteristics, for example, marshmallows and canned beverages. A full load of soda would cause the truck to weigh out

while a full load of marshmallows would cause the truck to cube out before it would weigh out. Commingling the products required a fictitious order variable that takes into account the balance of cube and weight. Orders were built to this specification.

Technology is under utilized: Despite considerable investment in technology to support integration, many managers reported that benefits were less than hoped for. Often this resulted from inadequate training and poor communication of information needs. One retailer, for example reported that nearly half of its product volume arrives at stores directly from vendor facilities. These direct store deliveries (DSD) are preceded by detailed information regarding purchase order number, product quantity and mix, pricing, etc. The theory is that these shipments can be received, scanned and moved directly to the store shelves without detailed check-in procedures. In reality, however, many DSDs require detailed check-in because the retail bar code scanner cannot read the bar code properly or because the vendor fails to include purchase order information. In these instances receivers manually enter purchase orders and print accompanying documentation.

Poor systems integration across the supply chain: A common problem identified through the interviews is that of reconciling data between two independent databases. In many cases firms recognize that investment in new systems is not always sufficient to remedy the problem. They also must reevaluate their processes in order to make any initiative successful. Often, this entails changing policies and performance measures to ensure compliance so that employees will not revert to the old method as soon as an issue arises.

Industry consolidation creates a resistance to change: The current environment of frequent mergers and acquisitions among food retailers makes many firms hesitant to act on any initiatives, particularly those that require significant resource investment. For this reason firms must often deal with limited information systems capabilities among potential partners.

Building trust and changing cultures: Trust is the critical foundation of any relationship. Success requires a willingness to exchange financial and operational information to allow both firms to monitor costs, promotional effect, inventory inflow/outflow, shrinkage, etc. Often, this becomes more of a cultural issue than a technological one.

Sample firms confirm that the cultures between two companies in an integration initiative must be compatible. Aligning core values regarding leadership, ownership, integrity, competition, trust, and the value of employees is a big part of making an initiative work. As one manager expressed it, “Successful relationships are centered on understanding that problems are expected and will be worked through together. You don’t just take your ball and go home.” Some firms perform psychological testing on new employees to help determine if they will succeed in the particular corporate cultural environment.

SUCCESS FACTORS

As food and consumer goods firms seek new ways to provide value that is relevant to end-customers, they must be committed to supply chain integration. As this research shows, firms are employing many innovations to streamline processes, eliminating redundant work and duplicate inventories, and tailoring services for customers of choice. The following elements

summarize the successful concepts used by the research participants to pursue supply chain logistics integration.

Enlist top management support: There is no substitution for senior executive approval and support. Many integration initiatives require realignment of strategies and structures and are accompanied by significant resource allocation. Additionally, internal functional buy-in can best be achieved when top-level managers work toward identical integration goals.

Instill cross-organizational vision and trust: Ultimate success requires partners that can be counted on to maintain a keen focus on a mutual vision for the relationship when short-term problems are confronted. Clearly defined objectives provide a mechanism to ensure that efforts are focused on adding value and not on unproductive agendas falling outside of these goals. Developing a history of interfirm trust in the relationship and between the individuals that maintain it facilitates this level of collaboration.

Establish cross-functional and cross-enterprise communication: Frequent, even repetitive, communication of objectives, measurements, and upcoming changes is essential to keep all parties to a relationship informed and focused. Periodic lapses in communication encourage participants to absolve themselves from responsibility for integration objectives. Frequent formal and informal face-to-face communication between managers at all levels transforms a relationship from a transactional-orientation to a partnership.

Promote cross-organizational ownership and decision-making: Processes that span accounting, merchandising, production, distribution, transportation, and purchasing in two unique companies characterize successful integration initiatives. Quarterly or more frequent

formal meetings of representatives from functional areas of both companies should expand beyond operating data reviews and problems to include focusing on strategic decisions required to determine new avenues of cooperation. Integration “champions” can act as facilitators to bring managers from each firm together to solve specific problems. Some firms interviewed rearranged staffing assignments to enable managers to work directly on logistics assignments with specific customers to prevent problems and improve processes.

Apply learning, skills, and new knowledge to other relationships: Decisions to implement new integration initiatives can be aided by existing infrastructure. In general, relationships are reserved for firms that share a critical mass of volume, however managers must branch out to expand long-term relationships with other key customers.

View supply chain integration as a long-term evolution: CPFR is an example of a long-term focus on improving both the customer's and the manufacturer's business potential. Short-term performance pressures still encourage push approaches rather than pull approaches (e.g., forward buy and diversion, which lacks a total cost vision). Performance scorecards can also increase short-term focus if they are used merely to penalize suppliers rather than create improvement programs that reduce cost or improve service in the long run.

Handle product/customer bundles on an order-by-order basis: Successful logistics integration requires flexibility to strike a balance between standardization and customization. The particular supply chain used to move a specific product to a specific customer depends on the type of relationship, replenishment service and cost requirements, domestic or import items, slow moving products, promotions, seasonality, etc. Frequent contact between merchandising and

marketing representatives and operational managers enables firms to plan each important movement to maximize service at the lowest total cost.

CONCLUSIONS

Many of the changes highlighted by ECR require the transformation of supply chain logistical structures and operating systems. This research reveals that achieving demand-responsive food and consumer goods supply chains focused on accommodating consumer lifestyles as described in ECR is difficult to achieve. The firms interviewed for this research, however, have heeded the call sounded by ECR and are applying the lessons to bring about structural logistical change one relationship at a time. These firms have begun the difficult process of reevaluating their desired roles in the overall consumer value equation and are coordinating with supply chain partners to attempt to achieve those roles.

The resulting supply chain structures offer an opportunity to integrate the core competencies and requirements of all firms participating in a specific arrangement. This concept leverages the benefits of specialized firms working together to increase overall efficiency and effectiveness. While specialization previously focused on internal functional excellence, the participants we interviewed act as independent providers of specific expertise that contribute to end-customer value. Specialization drives synergy that in turn allows supply chains to avoid duplication and eliminate non-productive activities. The result is that resources used to service end-customers are, in aggregate, minimal compared to traditional supply chain arrangements.

The operational structure described above requires a whole new way of thinking about relationships between business entities. These relationships must transcend simple buy-sell transactions. They must involve joint forecasting and planning of operations, shared assets,

technology, and measurement systems, and most importantly, shared information and risk. Trust and value must be at the heart of supply chain integration. True collaboration must be driven by a framework to guide the collaborative process that is not at its core dominated or self-serving to one party in the arrangement. Integration may begin at operational levels or executive levels, however, rules and agreements must drive mutually satisfactory policies concerning such critical aspects as risk and benefit sharing. Managers must develop a working environment conducive to fostering integration from infancy to maturity to ensure that all levels within and between supply chain partners support relationship objectives. Finally, participating firms must be willing to address difficult issues related to relationship de-integration far in advance of actual need to dissolve a supply chain arrangement.

The number of relationship integration efforts that fail for every one success is unknown. This research, however, has enabled us to better understand the critical variables required for developing and pursuing a plan to successfully integrate the supply chain.