

SUPPLY CHAIN INTEGRATION STRATEGY BEST PRACTICES

REDEFINING THE VALUE DERIVED FROM END-TO-END, INTEGRATED SUPPLY CHAINS

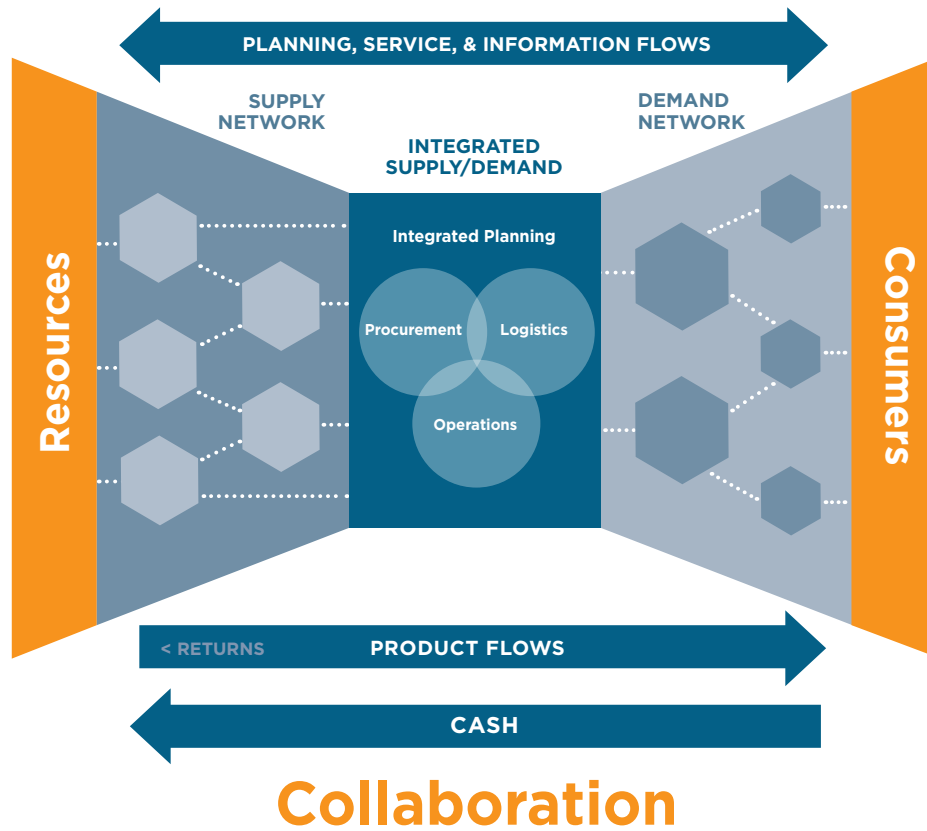
A WHITE PAPER BY THE GLOBAL SUPPLY CHAIN INSTITUTE

NUMBER TWO IN
THE **SUPPLY CHAIN**
STRATEGY SERIES

NOVEMBER 2018



GSCI END-TO-END, INTEGRATED SUPPLY CHAIN



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NUMBER TWO IN THE **SUPPLY CHAIN STRATEGY SERIES**
OF UT'S GLOBAL SUPPLY CHAIN INSTITUTE WHITE PAPERS

NOVEMBER 2018

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Our research

redefines end-to-end integration of the supply chain. When this strategy is executed with excellence, it can drive a more sustained competitive advantage.

Executive Summary

Benchmark supply chains have reported moving to integrated, end-to-end supply chain designs under a single corporate executive. This has been an important step in creating value in the last several decades. Integrated structures create a common strategy, vision, and culture focused on total value; this first step on the integration journey frequently delivers increased value and improved performance. But, if you're past this "honeymoon stage" on the integration journey, the question becomes: "Now that I'm committed, what do I do next?"

Supply chain leaders have gone beyond the organizational changes to ask deeper integration questions such as:

- Do I need to further define integration?
- Does integration go beyond asking procurement, logistics, transportation, manufacturing, engineering and sales/marketing to work together?
- Does integration require a deeper understanding of my supply chain(s)?
- Is there significantly higher value creation available from further integration?
- Do I need to further engage, enroll, and educate top corporate leadership on their work to support our supply chain integration journey?

The Global Supply Chain Institute's research indicates a strong need to act on all of the above.

Our research redefines end-to-end integration of the supply chain using a more robust and data-based approach. We found that when this strategy is executed with excellence, it can drive a more sustained competitive advantage.

We interviewed 16 leading companies across eight industries to examine how benchmark companies use integration to their advantage. Our research provides insight into how leading firms are expanding their knowledge and capability through detailed integration of their end-to-end

True integration

work is complex, requires significant resources to map the system, and requires leadership commitment to a long-term increase in the supply chain's capability.

supply chain. Interviews of top supply chain leaders also revealed eight best practices that increase value creation across the supply chain. Two key examples of these best practices include:

- Simplify, streamline, then integrate;
- Create a new breed of holistic supply chain leaders.

Additionally, the GSCI studied multiple examples of successful end-to-end integration initiatives (success being defined as increasing value creation of the end-to-end supply chain). We also include a major case study that provides important insights on improving results through mapping the system and developing consistent capability across boundaries.

While integration work benefits all organizations, supply chains with the following characteristics have been shown to gain the greatest benefit from an integration strategy:

- Large, complex global supply networks with multiple supply chains;
- Businesses that have made multiple acquisitions;
- Supply chains with significant new capabilities required to meet new customer channels (omnichannel, etc.), new regulations, and increased innovation pace;
- Supply chains where significant costs are incurred between the activities within the supply chain (i.e. the biggest cost savings are not within manufacturing or transportation but between activities);
- Every link in the chain is meeting its customer service metrics but the system as a whole is failing customers;
- Key Lean, Six Sigma, or TPM tools have been integrated into the supply chain system yet these strategies are not creating the value needed to meet business requirements; and
- Leaders make important decisions, yet many parts of the system are unaware or do not implement the actions necessary to support the changes.

During our interviews, one of our company leaders asked: “With all the benefits of an end-to-end supply chain integration strategy, why are more supply chain leaders not choosing this strategy? Why are only the benchmark supply chains working this strategy?”

The answer to these questions primarily rests within the issues that true integration work is complex, requires significant resources to map the system, and requires leadership commitment to a long-term increase in the supply chain's capability.

This white paper provides external networking and benchmarking data regarding best practices for developing a supply chain integration strategy, examples of applying best practices, and insight on the supply chain leader's role in creating a culture that supports integration.

If your supply chain experiences any (or all!) of the challenges noted above, this white paper provides external networking and benchmarking data regarding best practices for developing a supply chain integration strategy, examples of applying best practices, and insight on the supply chain leader's role in creating a culture that supports integration.

DEFINITIONS

Supply Chain—The end-to-end system of processes and activities required to deliver product from the supplier's supplier to the consumer's shelf.

Supply Chain Organization—The holistic resources and teams required to deliver products and services to the consumer with excellence. This includes, but is not limited to, procurement, manufacturing, engineering, process control, quality, safety/environmental, innovation program management, logistics (warehousing, transportation, inventory management, order fulfillment), customer service, and planning (materials, production, inventory, and category/customer).



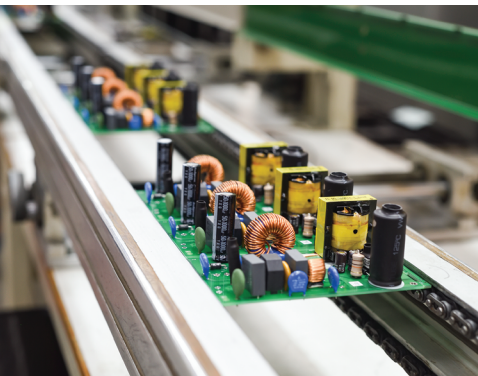


Introduction

Business thinking in the post-World War II industrialized world was rooted in the idea of mass production. For example, at the end of World War II, there were only eight shopping centers in the US. By 1960, there were 3,840.¹ Filling those shopping centers with consumer products required manufacturing processes that created large quantities of low-cost, standardized goods. Efficiency and scale ruled the day. Companies invested heavily in dedicated machinery operated by a semi-skilled labor force and watched for opportunities to vertically integrate. But by the late 1970s, the game had changed. Market saturation had diminished the growth potential of mass production in many sectors. Instead of increasing output, companies suddenly found themselves needing to increase productivity and innovation. Vertical integration gave way to outsourcing and a focus on core capabilities.



Consider just one example: Boeing introduced its mid-sized 707 in 1958. At the time, only about 2 percent of aircraft production occurred outside the US. But by the 1990s, competition from other manufacturers had begun to erode Boeing's market share. The company turned to outsourcing as a way to lower costs and speed production. When Boeing rolled out its new 787 Dreamliner in 2007, 90 percent of value added occurred outside the US. The company's vision of itself had shifted over that time period as well, from an aircraft manufacturer to a "systems integrator."² But there were risks involved. Supplier quality problems



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and time delays hobbled production, causing the Dreamliner to run three years over schedule and billions of dollars over budget.³ It was not until Boeing took a more strategic approach to integrated outsourcing, focusing on total value rather than simple cost reduction, that the Dreamliner project got back on track.⁴

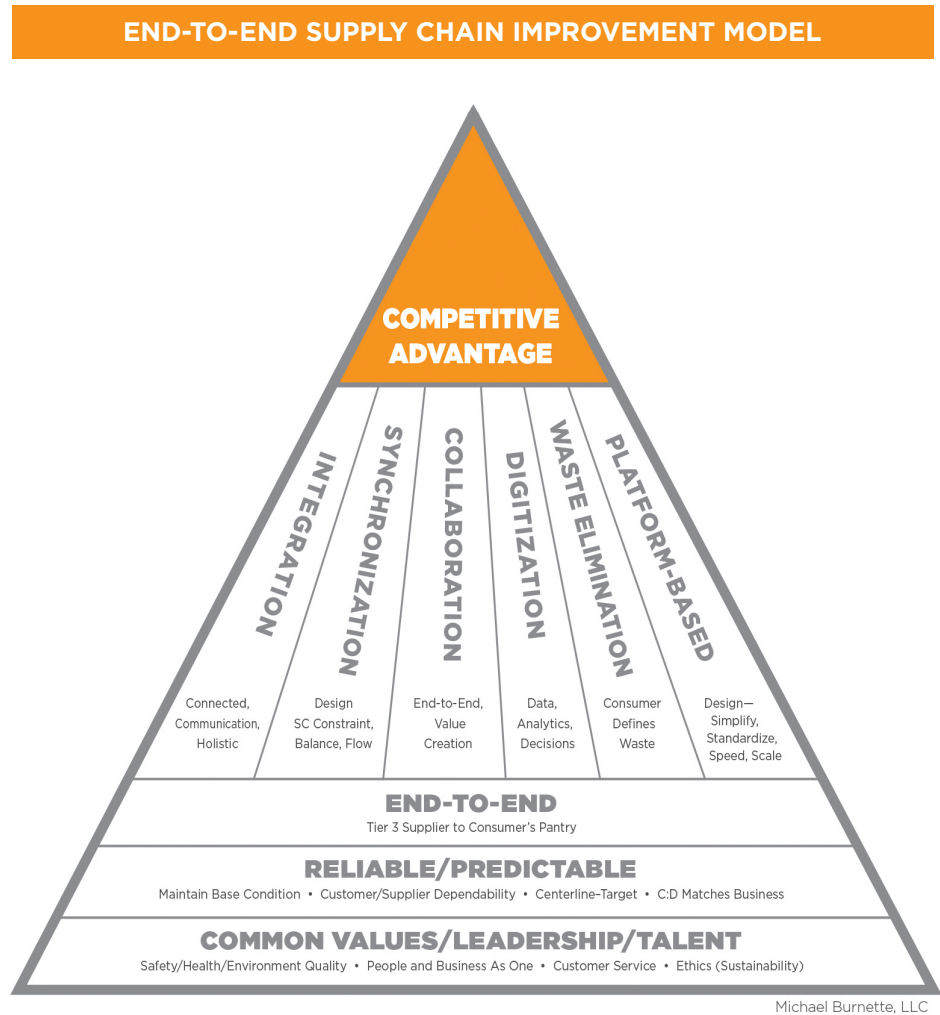
The Boeing example is telling. In today's business environment, bigger is not necessarily better. Rather, companies develop a competitive edge by building unique competencies while relentlessly driving productivity, efficiency and innovation in their organizations. This means companies must inevitably rely on external partners to achieve their business objectives. Therefore, success ultimately depends on collaborating effectively with upstream and downstream partners to deliver value to the market. The information revolution has accelerated this trend exponentially. From cloud computing to 24/7 connectivity, technology now allows workflows to be fragmented across a global network of interdependent actors. Internal business functions that handle purchasing, operations, logistics, finance, and marketing are often separated geographically and operating on very different schedules. The same is true for external supply chain partners. Pulling all these diverse fragments together into a seamlessly integrated value chain constitutes the core strategic advantage of the 21st century.

Enter supply chain management. Consultants Keith Oliver and Michael Webber coined the term supply chain management in 1982 to describe a new, strategic approach to managing a business. Oliver and Webber argued that companies must, "[view] the supply chain as a single entity rather than relegating fragmented responsibilities for various segments in the supply chain to functional areas such as purchasing, manufacturing, distribution, and sales...supply chain management requires a new approach to systems: integration, not simply interface, is the key."⁵ They recognized that in order to succeed in an increasingly specialized and fragmented business environment, managers needed to take a holistic view of the supply chain and to focus on strategic trade-offs that balance overall supply and demand. At the heart of this new approach to business was a fundamentally new concept: supply chain integration.

GSCI Supply Chain Improvement Model

Supply chain integration is one component of the larger GSCI End-to-End Supply Chain Improvement Model. Developed at the University of Tennessee out of engagements with dozens of leading companies, the GSCI End-to-End Supply Chain Improvement Model encapsulates the best of strategic supply chain thinking. The model depicts six proven strategies that supply chain leaders have used to maximize value for stakeholders while achieving a lasting competitive advantage. These strategies—developed by top researchers and tested in industry—have been shown to elevate not just organizational performance but total supply chain performance.

Figure 1



Supply Chain Leaders

who create the talent to lead the organization in the next several decades, ensure the brainpower and capability of their organization is sufficient to deliver shareholder and consumer expectations.

The model starts with following three core elements of strategic supply chain management that ground the six strategies that sit on top:

- A definition of the current end-to-end supply chain and a future vision for what that end-to-end supply chain needs to be in order to continue delivering customer value.
- Reliable and predictable supply chain operations built on eliminating waste, critically evaluating redundancies, avoiding rework and returns, delivering innovation, and carefully managing variation.
- Supply chain leaders who create the talent to lead the organization in the next several decades, ensuring the brainpower and capability of their organization is sufficient to deliver shareholder and consumer expectations. Common values that are well defined, explicitly promoted, and form the bedrock for the long-term, strategic vision of the supply chain.

Building on these three core elements, the model depicts six strategies that can be used alone, in sequence, or in combination to achieve a lasting competitive edge in the market place:

- **Integration**
- **Synchronization**
- **Collaboration**
- **Digitization**
- **Waste Elimination**
- **Platform Based**

Previous white papers in the GSCI Innovations in Supply Chain series have taken an in-depth look at topics related to platform-based supply chain management, digitization, and collaboration. In this white paper we tackle the critical issue of supply chain integration: what it is, why it's important, and how your company can achieve it.

Supply chain management

emerged out of recognition that in dynamic market environments company performance depends on greater integration across the value creation process.

What Is Supply Chain Integration?

SUPPLY CHAIN INTEGRATION is the process of connecting decisions and actions across an end-to-end supply chain (supplier's supplier to consumption) to drive total value for all stakeholders. Supply chain integration requires aligning strategies, effectively managing operations, and maintaining reciprocal flows of information among stakeholders to consistently optimize results for the entire supply chain. This means having a united and cohesive supply chain team within your company's four walls that includes not only the typical supply chain functions but also other representation from other major functional areas such as IT, finance, and marketing. It also means working with supply chain partners to achieve well-defined goals that are based on a common understanding of the value that is being created for stakeholders and consumers.

In the era of mass production, companies could afford to be less closely integrated with their supply chain partners. Strong, stable demand for largely standardized products meant that companies could invest far in advance of actual sales with the goal of lower costs and increasing utilization. Expanding consumer markets also helped to protect many manufacturers from the brutal realities of global competition.⁶ While this mass production model may still work in a few markets, for most businesses the times have changed, but the thinking has not.

The dominant business model still rests on the assumption that companies can operate within their four walls, taking orders as they come from customers and relying on suppliers to ensure necessary material and service flows. Research has shown, and industry experience has vividly illustrated, that when companies narrowly focus on just their slice of the value creation process—without considering the effects of their decisions on other parts of the supply chain—total supply chain performance suffers. Today, lack of supply chain integration can be seen in misguided capacity plans, poorly calibrated production schedules, buildup of excess inventory, inefficient use of logistics resources, poor customer service, slow response time to market shifts, lost revenues, and ultimately diminished returns.⁷

Supply chain management emerged out of recognition that in dynamic market environments company performance depends on greater integration across the value creation process. But the concept of supply chain integration remains poorly defined. Managers use a wide range of terms—cooperation, working together, interaction, coordination, and information exchange—when talking about integration. This lack of definitional clarity leads to substantial confusion over what supply chain integration is and what companies need to be focused on to realize its performance benefits.



Integration Concepts

We have defined supply chain integration as the process of connecting decisions and actions across an end-to-end supply chain to drive total value optimization for all stakeholders. But this definition requires some additional detail. At its core, supply chain integration has three central elements: supply chain collaboration, end-to-end process management, and reciprocal flows of high quality information. Let's take each of these elements in turn.

1. SUPPLY CHAIN COLLABORATION

Value creation is at the core of effective collaboration. As discussed in another GSCI white paper in the Innovations in Supply Chain series, supply chain collaboration is the process of working with strategic partners to identify, define, and pursue specific business opportunities that have the potential to increase overall supply chain value. Collaboration requires supply chain partners to negotiate a mutual understanding of the business opportunity and the role each partner will play in achieving specific objectives.

Because collaboration can be a difficult and potentially contentious process, meaningful relationships based on trust, commitment, and mutual respect among the different groups and individuals involved are critical. Strong relationships enable constructive debate on defining and refining supply chain goals. Once work on an initiative has begun, supply chain partners must continue to assess goals and objectives to ensure mutual alignment is maintained. Supply chain partners must also consider the unique constraints faced by different members of the supply chain and perhaps be willing to share resources to overcome such constraints. Here too, strong relationships add value by breaking down differences of perspective as different parts of the supply chain come together to achieve a common goal. Ultimately, the overriding aim of the collaboration process is to maintain focus on the specific returns that justify supply chain partners' engagement in an initiative.

2. END-TO-END PROCESS MANAGEMENT

End-to-end (E2E) process management focuses on linking activities into a single, seamless process that supports supply chain value creation. As with everything else in supply chain management, decisions regarding E2E process management must be made in the context of evaluating trade-offs. Perhaps the most important of these is the trade-off between increasing customer



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service—through increased product variety, greater availability, faster delivery, omnichannel distribution, return services, or greater customization—and the impact that increased customer service has on factors such as forecast accuracy, supply chain complexity, fulfillment cost, and inventory levels.⁸

Making the trade-offs necessary for E2E process management requires companies to focus on optimizing the overall flow of supply chain activities, rather than simply executing activities within their individual organizations. This means paying close attention to the management operating system, sales & operation planning process, management and control of material specifications, process tolerances, quality assurance, lead times, inventory levels, transportation and warehousing requirements, delivery schedules, and much more. E2E process management may require specific investments in advanced planning systems and data analytics tools that employ optimization and meta-heuristic approaches to find system-wide solutions or liaison personnel whose specific job it is to coordinate the efforts across stakeholders. The overarching goal is to streamline supply chain operations by eliminating waste while consistently delivering value to stakeholders.

3. RECIPROCAL FLOWS OF HIGH QUALITY INFORMATION ENABLING HIGH QUALITY DECISIONS

Data/information are perhaps the most basic type of resource in any supply chain, and therefore require special attention. Supply chain integration relies on high quality information flows. Information flows start with collecting and storing data that is accurate, valid, complete, and consistent. But making informed supply chain decisions requires more than just data dumps. In order to drive change, data analytics needs to be embraced to provide real time information for leadership/management that will in turn improve decision making to the point of being more proactive and ultimately predictive throughout the supply chain. It also needs to be relevant to the decisions being made and organized to focus decision makers' attention on situations that require action, while at the same time being adaptable for different users.⁹

Stakeholders also need to align on an interpretation of the data in order to consistently respond to the business environment. That means they must be clear on how their supply chain partners use the information. Information drives decision making at all levels of the supply chain. So, information flows need to enable both day-to-day operational visibility and long-term strategic planning. Best practices suggest presenting information in a simple format that divides between lagging and leading indicators. This way, information flows support E2E process management with real-time visibility into what's working and what's not. And information flows can help decision makers evaluate value creation coming out of collaborative projects.

Supply chain integration

focuses an organization in the end-to-end supply chain.

In today's business environment, integrating workflows across a global network of actors constitutes the core of competitive advantage, while failing to integrate can have serious negative consequences as our examples illustrate. Integration can start internally across the functional areas within a company or externally with upstream and downstream partners. Either way, companies need to focus on the three central elements of supply chain integration: collaboration, end-to-end process management, and reciprocal flows of high quality information. Each of these elements supports the overall objective of supply chain integration, which is to connect decisions and actions to drive total value optimization for all stakeholders. Maintaining this clear understanding of what supply chain integration means is the first step toward achieving better integration in your supply chain.

In the next section, we discuss the importance of supply chain integration for lowering costs and improving value creation.

Why is Supply Chain Integration Important?

Supply chain integration focuses an organization in the end-to-end supply chain. Optimum supply chain value¹⁷ is achieved when an organization is dynamically able to anticipate and meet demand through the synchronization of its buy-make-move-fulfill supply chain to deliver the greatest value to customers and investors at the lowest cost to business. This focus benefits internal as well as external stakeholders, and ultimately leads to sustained competitive advantage and long-term profitability.

Specific benefits that we have seen companies achieve through supply chain integration include:

- Implementing decisions across the entire supply chain quickly and accurately
- Measuring cost, reliability, inventory, and time at each activity node in the supply chain while eliminating non-value time, work, and other types of waste
- Providing supply chain stakeholders with visibility to proactively identify issues and major cost savings that may have been difficult to see before
- Reducing average lead times and lead time variability
- Shrinking total order cycle time, which enables an overall reduction in supply chain cycle stock
- Improving responsiveness and the customer experience through a more demand-driven supply chain
- Postponing buy, make, and deliver activities until demand is more known, thereby reducing the costs of uncertainty
- Less dependence on safety stock to manage variation
- Entering markets that may have seemed too volatile under a traditional non-integrated supply chain



Supply chain integration

is a means to an end. It is a tool for achieving total value in the E2E supply chain.

In addition to these benefits, companies that have pursued a strategy of supply chain integration have sometimes reaped unexpected rewards. In our research, we engaged with a major consumer electronics maker that was facing high levels of inventory due to uncertainty in demand forecasting.¹⁰ Through better integration with its downstream retail partners the company was able to develop a more responsive supply chain that could more accurately replenish on-shelf products. But an unexpected benefit also occurred: returns from retailers also declined dramatically. Returns are a major concern in the consumer electronics industry, costing manufacturers between 5 and 6 percent of total sales.¹¹ Reducing the overall level of returns was therefore a major gain for the consumer electronics maker, and was a direct result of its strategy of supply chain integration.

Supply Chain Integration Assessment and Delivery

Supply chain integration is a means to an end. It is a tool for achieving total value in the E2E supply chain. In the GSCI white paper, “End-to-End Supply Chain Collaboration Best Practices, best practice #4 “Total-Value-Based Business and Supply Chain measures” details a number of measures for improving total value. An E2E supply chain assessment should be the initial work to determine how much supply chain value can be created or lost for any set of strategic trade-offs. As you will review later in this paper, the assessment work is typically performed with best practice #3 “Map the Supply Chain, then Prioritize Biggest Total Value Opportunities”. Examples include: assessing the costs of carrying inventory against the need to be responsive to customer requirements; assessing investments in supplier development against costs associated with poor quality; assessing cost savings from outsourcing or offshoring against potential supply chain risks that come from loss of control.

The journey towards supply chain integration begins after a total value assessment. Supply chain integration is grounded in a clear-eyed vision of the supply chain value requirements. It drives achievement of that value, while also providing feedback on how best to maintain alignment among stakeholders for future success. Supply chain integration is therefore laser-focused on achieving tangible results for stakeholders.

Today, only a small number of leading companies use end-to-end supply chain integration to drive superior business results. To achieve total value through supply chain integration, these leading companies have focused on several key elements:

- **Defining their end-to-end supply chain:** Leading companies know exactly what they mean when they say “their supply chain.” There is no standard definition, but these companies are fully able to articulate how the flow of products, cash, and information are managed from supplier’s suppliers to customer’s customers. They have visibility into the role that individual stakeholders play in creating value, while also understanding how their supply chain fits into a broader social and environmental context.

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■ **Creating a common vision, mission, and values for the supply chain:**

Leading companies invest in creating a unified supply chain organization out of the fragmented collection of upstream and downstream entities with whom they interact. Through communications, leadership, and discipline these companies promote a supply chain culture centered on core values. They hold partners, and themselves, responsible for results by defining and implementing true supply chain metrics. And they reward success through recognition and incentives. The central role that common values play is detailed in “End-to-End Supply Chain Collaboration Best Practices,” a previous GSCI white paper in the Innovations in Supply Chain series.

■ **Focusing on supply chain human resource excellence:**

Leading companies recognize that supply chain talent is one of their most important resources. As reported on in “Supply Chain Talent – Our Most Important Resource,” leading companies understand that supply chain talent must not only have the technical skills to master their own area of responsibility, but also lead multi-functional processes that include both internal and external stakeholders. These companies implement proactive strategies to define current and future KSAs (knowledge, skills, and ability), and then find, recruit, develop, and retain supply chain human resources.

■ **Developing robust demand-supply integration (DSI) processes to support supply chain decision making and action:**

As reported on in “Advanced Demand/Supply Integration (DSI) Best Practices,” leading companies use well-defined, integrated business planning processes to create a single, unified number culture throughout their supply chain. These demand-supply integration (DSI) processes are driven by general managers and functional executive leaders and rooted in a culture of continuous improvement. Leading companies use their DSI processes to resolve demand-supply imbalances based on a strategic consideration of trade-offs involved.

■ **Eliminating non-value-added variation and other forms of waste:**

Leading companies have the control systems in place to identify non-value-added variation and the determination to eliminate it. But they don't stop there. These companies think broadly and creatively about waste reduction, from shrinking cycle times to rationalizing SKUs to product platform management to end-of-life management and reverse supply chain operations. Their goal is not to simply slash costs or achieve perfect efficiency. Rather, these companies attack non-value-added variation and other forms of waste as a means of supporting strategic objectives. Some “waste heavy” supply chains have chosen to focus on waste elimination as the end-to-end supply chain strategy (see Figure 1) prior to working on an integration strategy.



One example of a company that has placed end-to-end supply chain integration at the center of its business model is pharmaceutical giant Merck. Over the last decade, shifts in pricing and reimbursement structures have cut top line revenue in the pharmaceutical industry while patent expirations have created openings for new competitors. Companies like Merck have responded to these pressures by divesting non-core assets in favor of leaner, more focused business models.¹² Merck soon realized that end-to-end supply chain integration was critical to the success of this new approach. And at the center of their supply chain integration plan was a robust demand-supply integration processes to support supply chain decision-making and action.

Enabled by new supply chain planning technology, Merck eliminated forecast-driven production planning. Instead, through a mix of centralized data and decentralized action, Merck now provides manufacturers and suppliers with continuously updated forward replenishment requirements and minimum/maximum inventory numbers to enable them to adjust production schedules as needed. Supply chain integration at Merck has enhanced the company's ability to drive true customer demand to manufacturers and suppliers so as to enable a more rapid response. While they are not there yet, the end goal for Merck is for every node on the supply chain to be connected and to build to demand flow throughout the entire network.¹²

Top performing companies recognize that supply chain integration—both internally across the functional areas within a company and externally with upstream and downstream partners—is a powerful tool for achieving total value optimization. These companies have a clear vision of the value they want to create, and then use integration to achieve their goals. Key to the success of their supply chain integration initiatives are defining their end-to-end supply chain, creating a common vision for the supply chain, focusing on supply chain human resource excellence, developing robust demand-supply integration processes, and eliminating non-value added variation and other forms of waste. In the next section we will look more closely at specific ways in which companies can drive supply chain integration from the strategic to the operational level.

Supply chain integration is typically assessed at two levels: strategic and operational.

Integrating Supply Chain Strategy & Operations

Supply chain integration is typically assessed at two levels: strategic and operational (see Figure 2). Ultimately though, integration at the strategic level needs to drive integration at the operational level. At the strategic level, integration starts with a clear and unified understanding of the value that supply chain partners hope to create for customers. It is this value proposition to customers that must drive the integration goals of the supply chain. For instance, if the supply chain delivers a basic, commodity product where customers have lots of choices, profit margins are low, and disruptive innovation is rare, then supply chain integration needs to be focused on developing efficient processes that maximize utilization and inventory turnover, minimize cost, and meet a standard level of quality. Alternatively, if the supply chain delivers a highly customized product or service that requires flexibility in meeting unique customer requirements, then supply chain integration needs to prioritize speed, flexibility, and quality while aggressively reducing lead times. Whatever the case may be, the integration goals of the supply chain must align with the value proposition to customers. In this way, the value proposition defines the appropriate contribution of each supply chain partner and drives end-to-end decision-making in purchasing, operations, and logistics.

Figure 2

SUPPLY CHAIN INTEGRATION / STRATEGIC AND OPERATIONS	
STRATEGIC INTEGRATION Do the connecting nodes have the same operating strategy? (For example, if a supplier has a throughput strategy and manufacturing has a flexibility strategy, the integration is not achieved.)	OPERATIONAL INTEGRATION <i>(examples)</i> • Manufacturing • Materials • Transportation • Information/Data/Decision • People Systems



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STRATEGIC LEVEL INTEGRATION:

Strategic integration is the first step in supply chain integration. Strategic integration requires internal and external stakeholders to develop a common set of integration goals that directly support the value proposition to customers. Integration goals must be specific and must meet the unique needs of the target product line or customer segment. Stakeholders must also understand how they contribute to collective outcomes. Specific integration goals that directly tie each supply chain partner to customer value help to ensure that partners remain committed and aligned to an agreed upon action plan.

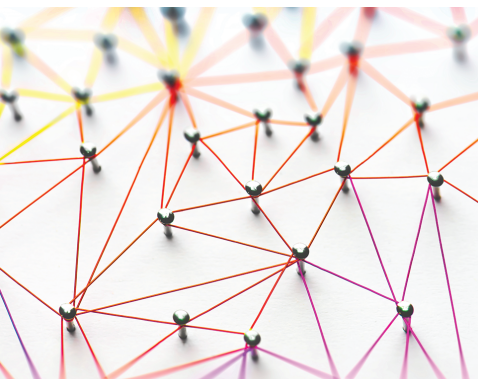
A common scenario involving a manufacturer and a component part supplier may help to illustrate the need for strategic integration. Oftentimes a manufacturer may follow a produce-to-demand strategy in order to lower inventories and remain responsive to customers. The component part supplier, however, may service multiple manufacturers and may schedule production to maximize throughput/utilization. Here the supply chain partners are not strategically integrated and therefore supply chain integration is difficult to achieve. The manufacturer and supplier would have to align on desired outcomes and develop an action plan that ensures each stakeholder appropriately contributes to overall supply chain success.

Strategic integration is a critical first step toward achieving sustainable benefits from broader supply chain integration. To assess how well they are doing in terms of strategic integration, companies should ask themselves whether they are regularly engaging supply chain partners in goal setting, action planning, risk management, and business reviews. The following list provides examples of goal setting points:

- Jointly establishing overarching supply chain goals that direct individual efforts toward supporting customer value
- Making sure there is joint agreement on supply chain goals
- Engaging constructively in debates about the goals of the supply chain
- Ensuring an open and transparent process for establishing common goals
- Establishing a regular process for reviewing joint supply chain goals
- Supporting each other in achieving common goals
- Adjusting goals and objectives to reflect constraints faced by different stakeholders

Operational integration

requires a detailed map of activity nodes and transitions.



OPERATIONAL LEVEL INTEGRATION:

Operational integration occurs at the level of supply chain business processes, including customer relationship management, sales forecasting and demand management, production and operations management, purchasing and supply management, order fulfillment, resource management, new product development, end of product life and commercialization, reverse supply chain management, and data management. Operational integration requires supply chain stakeholders to adopt a process perspective that focuses on optimizing the overall flow of supply chain activities, rather than simply executing activities at the stakeholder's individual node. Stakeholders must also work to resolve conflicts in decision making to ensure that the sequencing and timing of activities are matched with maximum efficiency. The goal is to create more streamlined and consistent supply chain operations that provide value to the investors and generate a remarkable experience for the customers.

Operational integration requires a detailed map of activity nodes and transitions. The focus is on ensuring that resource requirements are met at each stage of the supply chain. Resource requirements include—but are not limited to—materials, equipment, transportation, people, and information/data. For example, a manufacturer of plastic bottles that works with a supplier of PET resin might focus operational integration on the following resource requirements:

- **Materials:** Does the resin supplier's material specifications match the specification requirements of the manufacturer?
- **Equipment:** Does the resin supplier have equipment that meets the process control requirements of the manufacturer? Can the manufacturer's equipment accept the capability of the supplier's resin?
- **Transportation:** Does the resin supplier ship the product in transportation packaging that is efficient for itself and the manufacturer?
- **People:** Is capable leadership and staffing in place, with the appropriate tools/processes, to solve problems, set priorities, and communicate performance?
- **Information/Data:** If a shipment is placed on hold because of quality issues, is this information immediately communicated to the supplier so they can undertake corrective action? Is data available to both stakeholders? Does information on decisions flow between stakeholders in real time? Is the data accurate and formatted to facilitate effective action?

To assess how well they are doing in terms of operational integration, companies should ask themselves whether they are regularly engaging supply chain partners in the following ways:

- Making sure stakeholders see themselves as part of a larger overall supply chain process
- Actively managing lead-times across stakeholders
- Ensuring that activities are synchronized (balanced flow) across the supply chain
- Making sure stakeholder decisions do not conflict with each other
- Making sure everyone is focused on process optimization rather than achieving separate goals
- Making sure governance and audit processes are providing value
- Minimizing waste to drive competitive pricing
- Improving the organizational culture to support common vision
- Focusing on continuous improvement



INFORMATION INTEGRATION:

As noted earlier, data/information are perhaps the most basic type of resource in any supply chain, and therefore require special attention. Information integration supports both strategic and operational level integration, and therefore needs to enable both operational, day-to-day visibility as well as long-term strategic planning. To assess how well they are doing in terms of information integration, companies should ask themselves whether they are regularly engaging supply chain partners in the following ways:

- Making sure relevant information gets to the right people in different areas of the supply chain
- Making sure data is driven from robust data analytics
- Making sure everyone understands what information needs to be communicated out to different stakeholders
- Making sure information that is being communicated is useful to those on the receiving end
- Making sure everyone understands how information is being used in different areas of the supply chain
- Making sure those on the receiving end understand why they are getting the information that they are getting
- Making sure the information being captured is still relevant
- Making sure the information is formatted for specific audiences to drive improvements and/or sustain performance
- Making sure the cost of data management is understood
- Making sure (validate) that real-time decisions are being made and executed

Supply chain integration can be complex. In order to do it right, companies need to focus on strategic, operational, and information integration in tandem. Each of these levels of integration need to support and reinforce the other to ensure that goals remain aligned and total value is optimized.

Next, we review the best practices that were revealed by our interviews with top supply chain performers. These best practices shed light on how industry leaders approach the complex but rewarding task of integration.



*More than 100
best practices came to light.*

Best Practices

Introduction

In discovering these end-to-end supply chain integration best practices, we conducted field interviews with 16 benchmark companies. These companies spanned CPG, equipment, food, auto, chemicals, packaging, retail, and textile companies.

Most examples focused on how companies were utilizing best practices in North America, but many companies also shared best practices developed from their global operations. Because of the breadth of the topic, the industries sampled, and the different stages of maturity, benchmark company focuses were broad. More than 100 best practices came to light. We have chosen the top eight of these to discuss and share in greater detail. These eight best practices represent the most innovative and impactful ways of approaching integration. None of the benchmark companies excel in all the best practices. Additionally, most of the benchmark supply chain companies emphasized the need for practices to evolve as a result of renewal/learning from past efforts.

SC INTEGRATION BEST PRACTICES

1. Jump-Start Supply Chain Integration with Passionate Top Leadership
2. Design a Seamless Supply Chain Team Built to Create Total Value
3. Map the Supply Chain, Then Prioritize Biggest Total Value Opportunities
4. Drive Progress Through a Drumbeat of Rigorous SC and Business Reviews
5. Simplify, Streamline, Then Integrate
6. Partner to Win—Integrating Customers, Partners, and Suppliers
7. Integrate Digital Information Systems Enabling Real-Time End-to-End Decision Making
8. Create a New Breed of Holistic Supply Chain Leaders



***Energetic and
passionate***
supply chain leadership
is vital to deriving value.

1. Jump-Start Supply Chain Integration with Passionate Top Leadership

Energetic and passionate supply chain leadership (the supply chain officer, SC VPs, directors, department leaders), fully supported by the CEO is vital to deriving value from virtually any supply chain wide strategy. Integration is not an exception to this reality. This leadership best practice was universal with every benchmark, supply chain we interviewed. However, top supply chain leadership cannot deliver supply chain integration optimization without top corporate leadership enrollment and support. Companies that lack this support from non-supply chain general management have found their integration progress slowed and, in some cases, nearly halted.

The benchmark companies have an end-to-end supply chain organizational design including procurement, inbound logistics, engineering, manufacturing, quality, safety, warehousing, distribution, customer logistics, etc. Their design enables the supply chain officers to focus on best value for the end-to-end system. If your supply chain does not have this type of organizational structure, organizational renewal will be a necessary step as the strategic, operational and informational design takes shape.

Some of the critical leadership work in an end-to-end supply chain integration strategy includes:

- Learning about integration and how it creates best value. This would include benchmarking and external networking.
- Creating a driving business need. The clear and concise business case for change should be linked to the business strategy. The work is best accomplished when the need is simple, clear, and urgent. This work includes different levels of communication tools, including:
 - Elevator speech—two-minute-long compelling need
 - Five-minute informal networking message
 - Multiple levels of presentation material
- Creating energy and support with the overall business leader, functional leaders, and supply chain leadership. Integration work crosses supply chain boundaries and will require resources and support from the other functions
- Establishing clear, end-to-end goals and overlapping measures for all supply chain disciplines
- Leadership in implementation of the other best practices we outline



EXAMPLES:

- 1.** A global CPG company has operated with an end-to-end integration strategy for the past several years. The company suffered from very complex, multiple, global supply chains which became slow and non-responsive. The value creation from the supply chain integration strategy dramatically improved as the supply chain focused on delivering a true competitive advantage. The supply chain leader influenced the company to develop and implement the integration strategy as a multi-functional effort. This enabled the business to drive value not only from supply, but dramatically improve business processes (e.g., S&OP). An unexpected benefit of the strategy has been the ability to integrate multiple, complex acquisitions with limited resources. Now, the commercial business leaders view the supply chain as a vital function that leads value creation as opposed to a cost center.
- 2.** A second global CPG company is utilizing a supply chain integration strategy to drive value. Over the last three years, the supply chain was redesigned to focus on integration from sourcing through the consumer use (end-to-end). Leadership developed massive expectations and deployed them to the entire supply chain organization. Improvement teams were created to eliminate waste across the end-to-end supply chain versus just within each supply chain discipline (procurement, inbound logistics, engineering, manufacturing, warehouse/distribution, and customer logistics). Annual supply chain value creation is anticipated to double to nearly \$700 million per year over the next two years.
- 3.** A global heavy equipment manufacturer has seen the negative impact of losing a focus on integration. A change in leadership brought a new corporate and supply chain change strategy. The new leadership's assessment was that the organization needed more accountability. The plan included changing to a de-centralized, departmentally-focused organizational design. Value from the integration of systems has been lost through implementation of sub-optimized departmental rewards and measures. Finding opportunities across supply chain disciplines has been deprioritized, significantly reducing the pipeline of big ideas in the company.

Benchmark
*supply chains are
organized end-to-end
under a single supply chain
leader.*

2. Design a Seamless Supply Chain Team Built to Create Total Value

As discussed above, the benchmark supply chains are organized end-to-end under a single supply chain leader. This leader is a critical member of the top corporate leadership team and must have the full support of the CEO. This design enables the supply chain to have a strong multi-functional advocate on the top team that understands the value in an integrated end-to-end supply chain system. In this way, supply chain initiatives become closely linked to the business strategy and become critical to the success of the enterprise goals.

Some of the key design items beyond an integrated supply chain organization that the benchmark companies are focusing on include:

- Qualified supply chain leaders on all multi-functional business teams (categories, regions, global, etc.)
- Truly multi-disciplinary supply chain teams with qualified representatives from all impacted supply chain disciplines
- Selection of new suppliers and partners with common operating strategies (integration work includes assessing and resolving supply chain linkages where the operating strategies differ)
- Clarifying key roles to ensure a holistic, end-to-end focus
- Renewal of supply chain discipline-wide and departmental measures to ensure overlapping and consistent total-value-based measures for strategic integration
- Renewal of multi-functional business processes (e.g., S&OP, new product initiative launch system, corporate system standardization) to ensure operational integration
- Addition of a supply chain strategy leadership role reporting to the overall supply chain leader accountable for facilitating the development and delivery of the supply chain integration strategy



EXAMPLES:

- 1.** A global retail supply chain has focused on integrating its supply chain system by redesigning its organization under one end-to-end structure. After the overall supply chain was changed, the leadership redesigned department structures. The engineering, transportation, and distribution organizations required the most effort to eliminate departmental-based cultural systems. Then, the leadership team focused on renewing reward and measurement systems to ensure the disciplines were focused on total value. This work has enabled the supply chain to be more focused and responsive to business requirements.
- 2.** After formally integrating procurement into the end-to-end supply chain organization, a regional food manufacturer focused on integration to increase supply chain responsiveness. The system complexity had increased exponentially due to a 10-fold rise in the pace of new product launches. The organization suffered from a loss of responsiveness to new business needs. Resources were stretched to the maximum, creating high organizational stress. Leadership began to understand that many of the activities were not creating value. The leadership team renewed the strategy and worked to eliminate non-productive activities. As with many examples, this work included role clarity, measurement renewal, and cultural changes. One of the key barriers was the standard costing system. The lack of activity-based cost analysis slowed the necessary decisions to drive out unproductive work. An example is the manufacturing disruptions caused by low-cost suppliers that were not adequately included in sourcing decisions.
- 3.** A global CPG company working on supply chain integration has renewed the requirements for supply chain leaders on multi-functional business teams. After years of participation, leaders found that supply chain managers with experience across multiple supply chain disciplines were much more effective in the business team roles representing the supply chain. Changing the qualification requirements for these roles has reduced rework and has enabled business teams to fully leverage strong capability areas.

*An end-to-end
integration strategy
requires detailed analysis
of the supply chain.*

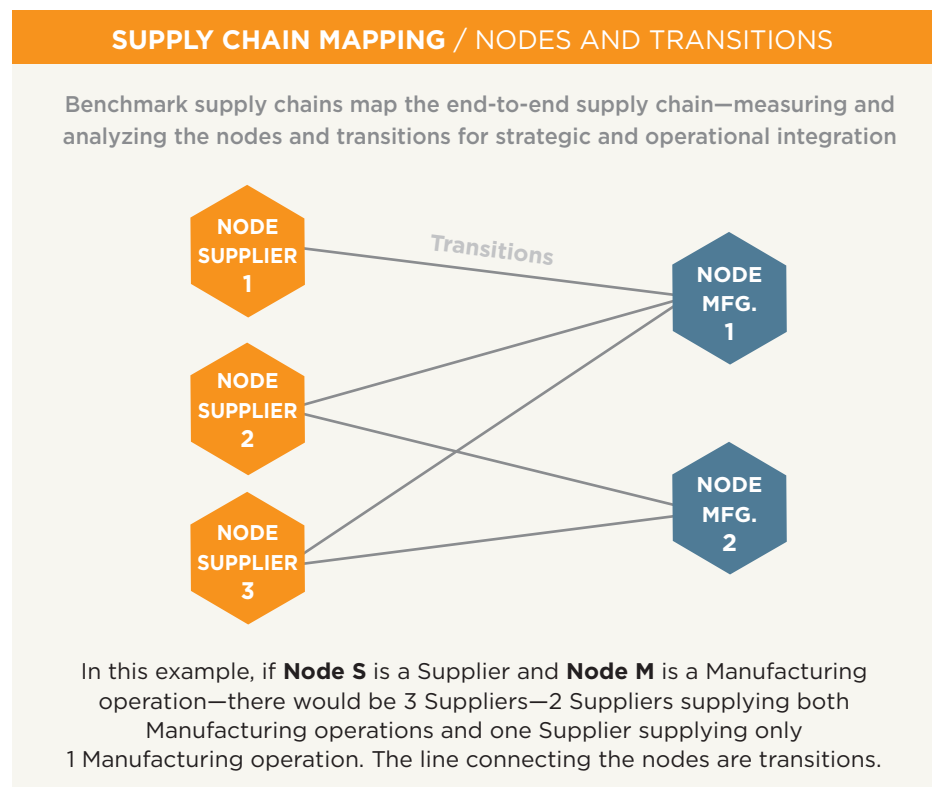
3. Map the Supply Chain, Then Prioritize Biggest Total Value Opportunities

As discussed earlier, an end-to-end integration strategy requires detailed analysis of the supply chain. Since the supply chains that benefit most from the integration strategy are complex, the effort and resources to complete this analysis can be large. It has been observed by the benchmark companies that this effort can have a significant return as follows:

- Creates higher total value opportunities and projects
- Teaches your organization in detail about the supply chain it is managing—in fact most benchmark companies have found significant understanding leading to resolution of long term systemic problems
- Underscores the importance of designing the supply chain right the first time and the importance of robust design change management

A common term for the detailed supply chain analysis is “mapping the supply chain.” Figure 3 displays a visual of how the mapping could be documented. Complex, global supply chains can have hundreds of suppliers. As these suppliers may source multiple materials to multiple manufacturing sites, it is easy to understand that the mapping effort is significant.

Figure 3





Most benchmark companies select a limited number of measures that can be assessed across the end-to-end supply chain.

After mapping the physical flow, the team should understand both the strategic and operational components of the nodes and transition. Example integration questions follow for a material being sent to a manufacturing operation.

STRATEGIC INTEGRATION

If all nodes/transitions have the same strategy, then integration exists. If not, modifications to the strategy should be analyzed for value creation.

- What is the supplier strategy?
- What is the manufacturing strategy?
- What is the transportation of material strategy?

OPERATIONAL INTEGRATION

- Are the manufacturing tolerances and capabilities consistent?
- Are the material specifications, capabilities, and ranges consistent?
- Does real-time information enable decisions that are implemented simultaneously at the supplier, transportation provider, and manufacturer?
- Do sufficient and capable resources exist to solve problems and improve the system?
- Does the transportation (transition) system have the capability (capacity, flexibility, quality, material protection) to support the flow of materials?

After assessing the integration, the capability of each node and transition should be documented. This includes the measures and the opportunities for integration improvement.

Most benchmark companies select a limited number of supply chain mapping measures that can be assessed across the end-to-end supply chain. Typical measures include:

- Cycle time
- Reliability or dependability
- Cost or value
- Cash (any node or transition where inventory piles up is typically a supply chain defect)

*Measures should
be focused and standard
across the end-to-end
supply chain map.*

EXAMPLES:

1. A global automotive company completed the integration analysis with internal resources first, then hired an external analyst to ensure that the work was not bound by internal constraints. Additionally, this supply chain identified hot spots—areas where the assessment pointed to highest opportunity for value creation. Additional time and analysis is conducted every year (annually renewed assessment) in these areas.
2. A global CPG company found that pre-alignment with top leadership regarding how the opportunities discovered in the assessment will be addressed has enabled a faster chartering of the project teams.
3. A global supply chain focused most of its assessment measures in the area of dependability/customer service as a high-level supply chain performance measure. If the supply chain is integrated, the flow of product moves seamlessly through the system and delivers the customer/consumer needs as it is designed to do.

4. Drive Progress Through a Drumbeat of Rigorous SC and Business Review Systems

Many supply chain and business studies have discussed the importance of measures and reviews. “You get what you measure” and “you get what you inspect” are common business phrases. Benchmark supply chains use these approaches with a supply chain Integration strategy. Leadership and team reviews are performed within the supply chain and within multi-functional business forums.

DRUMBEAT OF SUPPLY CHAIN/BUSINESS

1. **Weekly Reviews**—Project team and department reviews (review team activities and schedules)
2. **Monthly Reviews**—Review with senior supply chain leaders (review results, plans, gap analysis, and align corrected action)
3. **Quarterly Reviews**—Review with senior supply chain and business leaders (assess results and adjust plans/priorities if needed)
4. **Annual Reviews**—Review with senior supply chain and business leaders (align plans for the next 12 months, celebrate successes and document learning for reapplication)

The reviews need to be based on aligned integration measures (see #3 Map Best Practice). These measures should be focused and standard across the end-to-end supply chain map. It is vital that supply chain and business leaders align to these measures prior to the project team charters and review processes.

EXAMPLES:

1. A large global CPG company utilizes robust weekly, monthly, quarterly, and annual review processes. They take this planning to the next level by linking corporate financial schedules (budgeting, forecast, and long term business planning) into the review process to create a holistic planning effort.
2. A global food company takes the weekly, monthly, quarterly, and annual review processes to the next level by having a quarterly project team sponsor meeting. In this meeting, sponsors look for synergies between teams and opportunities to shift resources to the highest value work.

5. Simplify, Standardize, Then Integrate

In our white paper on Platform Management Life Cycle (PLCM) best practices,¹⁴ the core best practice is to simplify first, standardize the platform, then drive speed and scale. The benchmark companies with a supply chain integration strategy follow a similar approach. During the assessment and design stage of integration, the first effort is to simplify the supply system (e.g. Do we need 12 suppliers for material X?). The second step is to follow a standard approach to the supply chain design when possible. These two steps reduce the integration work significantly. In fact, many supply chain managers argue that the supply chain simplification work may create some of the highest value projects.

Some of the critical techniques used in the simplification and standardization work include:

- Benchmarking streamlined supply chain designs (external and internal)
- Leveraging data analytics tools to eliminate false assumptions and design for real needs
- Eliminating redundancies
- Leveraging suppliers, partners, and customers to facilitate the analysis and simplify
- Asking yourself, “What is the business requirement? Is this step focused on that requirement?”
- Leveraging PLCM best practices

Many supply chain managers argue that the supply chain simplification work may create some of the highest value projects.

Customer, partner, and supplier involvement and ownership in supply chain integration is critical to developing better solutions and providing sufficient resources to complete the integration work.

EXAMPLES:

1. A global food company invested hundreds of millions of dollars re-inventing its supply chain. The supply chain had become slow, expensive, and a business constraint due to old paradigms, acquisitions, lack of standardization, and obsolete equipment. The supply chain was simplified and standardized to enable an end-to-end, integrated system. Overall re-invention rate of return estimates were exceeded.
2. A global CPG company focused on streamlining its manufacturing and warehousing operations to drive scale and responsiveness. The number of factories and warehouses were both reduced by two-thirds. Additionally, more than 180 manufacturing operations were modernized to meet current business requirements.

6. Partner To Win – Integrating Customers, Partners, and Suppliers

Due to the complexity of most supply chains, insufficient resources and brainpower may exist to fully drive maximum value possible from the supply chain. Further, the internal supply chain capability may not be sufficient to deliver expanding business requirements.

Customer, partner (partner examples include: 3PL, 4PL, contract manufacturer, engineering design firm, consultants), and supplier involvement and ownership in supply chain integration is critical to developing better solutions and providing sufficient resources to complete the integration work.

The starting point is with the consumer and customer partnerships. Benchmark supply chains utilize strategic customers to define the product/service business requirements. Example questions include:

- What is a perfect order/supply?
- What product and supply information is helpful to customer and consumer service or consumption (including parameters, capabilities, and measures)?

Due to the rapid changes in customer channels, last mile supply chain activities and requirements have become even more vital to supply chain integration. Benchmark companies are leveraging customer integration efforts as a source of competitive advantage that results in long term increased business. These integration efforts range from managing customer's inventory levels to designing unique product delivery systems that improve consumer shop-ability.

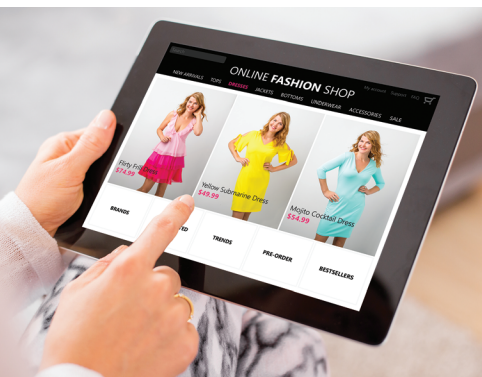
On the supplier and partner side of the supply chain, the integration work centers on:

- 1. Increased understanding of suppliers'/partners' operating strategy and operational systems**—Start by asking: “Do you fully understand the end-to-end supply chain? Do these strategies integrate with your manufacturing/warehousing capabilities and requirements?”
- 2. Increased knowledge and resources to improve value**—Can the supply chain partner with suppliers and external resources to eliminate resource overlap, focusing the larger pool of resources on common value creation? Can the people with the most expertise (blind to organizational structures) be focused on solving problems and creating value?
- 3. Partnerships with key suppliers as a source of new ideas and capabilities**—As the pace of business increases this is becoming more critical going forward. In some cases suppliers can provide higher quality, faster, and more flexible supply chain solutions.

These key partners will likely have longer-term contracts, innovation deliverables, and even some co-location to best facilitate integration.

EXAMPLES:

- 1.** A global chemical company is utilizing telemetry (automated product attribute sensors that wirelessly communicate product temperature and pressure quality measure to suppliers) to fully integrate with customers. This enables a common, trusted information system to manage product quality. Telemetry in combination with vendor-managed inventory provides the tools needed to manage their elements of the supply chain across traditional organizational boundaries.
- 2.** A large regional package supplier company is using value-added analysis with customers to ensure integration between packaging materials and manufacturing. By jointly identifying and eliminating non-value added tasks/materials/processes the partners are defining the critical elements of integration. A critical learning is the importance of data integrity, governance, and accuracy to the integration work.
- 3.** A global chemical supplier is working with customers to develop chemical additive kits. These kits contain the exact amount required for customer manufacturing batches. The chemicals in the kits match the material specifications at the customer’s manufacturing tolerances. This process fully integrates the operational aspects of an integration supply chain.



Integrated systems
act as one supply chain.

7. Integrate Digital Information Systems Enabling Real-Time End-to-End Decision Making

The GSCI white paper “A Savvy Guide to the Digital Supply Chain”¹⁵ reviews how the age of digital and cloud applications have opened huge opportunities for both small and large supply chains. An end-to-end integrated information system is the major tool required for an integrated end-to-end supply chain. The days of managing even a simple supply chain with excel spreadsheets are largely over. The cost and complexity of these systems have limited their use to larger enterprises. In the digital revolution, this barrier is being eliminated.

Most of the benchmark supply chains interviewed had to modify their information systems with both large and small changes to ensure that information was passed across the critical nodes/transitions, ensuring that information critical to planning, processing, and decision making was real-time and accurate. They recognized that the only way to get more agile and react better to commercial changes was to approach them as end-to-end efforts supported by the best and latest information systems technology.

The major challenges included:

- Sending information/data across different companies (legal, proprietary, and competitive concerns)
- Incompatible hardware and software systems between customers, suppliers, and partners
- Alignment on what is the critical information need for planning, processing, and decision making

Integrated systems act as one supply chain. If the manufacturer decides to place a finished product on hold for a quality issue, do all the related suppliers, partners, and customers have the same information at the same time? Do all the necessary nodes in the supply chain place materials/products in question on hold at the same time? If not, the supply chain risks creating significant waste, indicating that the supply chain is not integrated.

One of the companies we interviewed explained it as, “Our supply chain is like a large battleship. It is strong, large, effective, and moves efficiently in a straight line. Unfortunately it takes a long time to turn the ship. Our information system tells us when we (including customers, suppliers, partners) need to turn. Having this information accurately and in real-time avoids running into a storm.”

Holistic leaders
in an integrated world have shifted their focus from optimizing their own department to driving end-to-end value.

EXAMPLES:

- 1.** A large global CPG company co-developed the concept of control towers to establish key decision points in the supply chain with a system vendor. These control towers utilize artificial intelligence to access data and suggest decisions. Customer demand and key locations throughout the supply chain have been identified for towers. The control tower's role is to determine necessary changes in the plan and distribute this information on a real-time basis to impacted elements of the system. The project completed its pilot, successfully meeting business goals; it now has been rolled out to two of the largest global regions.
- 2.** A second, large global CPG has decided to fully utilize its SAP system. Frequently supply chain managers spend too much time developing proposals for new information systems. The leadership directed the team to find ways to fully utilize the current SAP system to drive accurate, real-time information. This included critical suppliers, customers, and partners which are primarily on SAP. The organization found significant returns on optimizing existing assets.

8. Create A New Breed of Holistic Supply Chain Leaders

Most supply chain leaders we interviewed have renewed their talent strategies to support their end-to-end supply chain integration strategy. Holistic leaders in an integrated world have shifted their focus from optimizing their own department to driving end-to-end value. This shift requires leaders who can think broadly, work effectively across organizational boundaries, utilize new digital/cloud based tools, embrace change, continuously learn, think externally, and react to the latest business requirements.

Supply chain leaders must understand the requirements of consumers, customers, and the business. Supply chain's equal-seat membership on all key multi-functional business teams is important to enable the supply chain leaders' understanding of the business. With this information, leaders can utilize the supply chain capabilities to deliver business requirements, create competitive advantage, and develop the new capabilities necessary for the future.

While technical mastery is still critical in an integrated supply chain, it must be complimented with an end-to-end understanding of the supply chain. The implication of an individual action's effect on the whole system must be understood. Actions that improve end-to-end value drive the most important work.

Supply chain and human resource leaders are translating this input into a new breed of passionate, holistic supply chain leaders. The following GSCI five-step talent management model (Figure 4)¹⁶ provides a framework for this talent work.

Figure 4

FIVE-STEP TALENT MANAGEMENT FRAMEWORK	
Analyze	Clearly defining the skills, experiences, and capabilities required in the supply chain today and for the next decade.
Find	Locating a critical mass of people with the skills, experiences, and capabilities needed to deliver the supply chain goals.
Recruit	The process of attracting, selecting, and hiring the resources needed.
Develop	The systems required for building skills, experiences, and capabilities in your talent to fill all the roles (at all levels) in the supply chain organization. The process to enable all people to be their best.
Retain	The systems to reinforce, support, recognize, and reward supply chain resources. The process to keep your important resources and best talent.

Talent work includes:

- Recruiting future talent
- Developing current talent (e.g. executive education, continuous learning, etc.)
- Focusing on developing 100% of your talent to deliver business needs

EXAMPLES:

- 1.** A global CPG company has shifted its supply chain talent development program to start with a thorough understanding of the business. Additionally, all critical multi-functional business team membership is tracked to ensure inclusion of qualified supply chain leaders. These leaders must have supply chain experiences across the end-to-end system to represent the function. The critical supply chain director role requires demonstrated ability to influence the commercial community skills as well as end-to-end experience.
- 2.** A second global CPG company is shifting the balance of leadership experience. Historically all supply chain leaders have been developed within the company. Now the system includes a mechanism to attract some external leadership talent. This change is intended to maintain industry mastery and drive a diversification of thought in supply chain leadership.
- 3.** A third global CPG company is re-defining its supply chain roles. The emphasis on computer skills and managing details will be lower as the digital world eliminates these roles. Role descriptions will be eliminated in favor of rapid flow to the work. The focus will be more on the skill requirements. Digital tools mastery and cloud skills will be an entry requirement. Finally, the company is analyzing the concepts of the gig economy where organizations move to a blend of permanent and short-term work contracts.



Case Study

A major agricultural and distribution business serving growers across the US is using a supply chain integration strategy to achieve its goal of becoming the market leader. The company had made more than 40 acquisitions of various sizes when the market was at its peak. Unfortunately, a subsequent prolonged downturn in the US agricultural commodities market left the company in an adverse financial situation. Market shifts left a fragmented supply chain that had inefficiencies across its network. The footprint was simply too large for the current market with service locations, resources and capital equipment that was not being utilized.

Maine Pointe, a global supply chain and operations consulting firm sponsoring this paper, conducted work to resolve these challenges that mirrors many of the benchmark interview best practices from the GSCI's research.

The company's top leadership and equity owners recognized that to right-size the company, a significant transformation would be required, with full leadership support and an ongoing engagement to sustain results. Through discussions, company leaders understood that supply chain integration and collaboration were fundamental in reaching the targeted goals. Leadership also concluded that their internal capability to assess, plan, and improve integration was insufficient. The company chose to partner with Maine Pointe to restore competitive capability in its supply chain given their approach to supply chain transformation developed in the Maine Pointe Total Value Optimization Guaranteed™ program.¹⁷

The leadership team carried out an in-depth analysis with Maine Pointe across the entire business over six weeks. During that time the team documented in detail the business processes, identified areas that were contributing to the problems, and tested potential corrective actions. A complete engagement approach, with budget and cash flow benefits, was created to assure that results over a given period of time would meet the business requirements as well accelerate the positioning of the company for a significant changes in costs, cash, and growth.

The number of recent acquisitions and a lack of enterprise-wide synergies had resulted in unique processes and activities. This fragmented the various supply chains. Additionally, the acquisitions significantly reduced the quality of historical talent and experience in the organization. Through this very thorough assessment, they developed a strategy and built a timed implementation plan for improvements across the organization to deliver cost and cash savings.



***Proactive, personal**
leadership involvement in
the planning, action plans,
and business reviews
drives results.*

Cross-functional teams were deployed to work simultaneously across procurement, logistics, operations, data analytics, leadership, organization improvement, and S&OP.

A management operating system (MOS) was developed and implemented with clear metrics and a structured review process to ensure accountability. This included a useful operational dashboard with key performance indicators (KPIs) that clearly integrated the end-to-end supply chain.

Operations were redesigned to significantly improve productivity and role clarity. Right-sizing the supply chain resulted in the elimination of unneeded supply locations and significant head count reduction. Positions that were redundant or where skills needed to be refreshed were evaluated, combined, or eliminated. The operations staffing was reduced by 15 percent, while sustaining current operations, improving customer experience and supporting future growth.

A consistent set of work processes and procedures were rolled out across all locations that allowed the company to easily replicate operations as it grew.

Aggregation of real-time information allowed for better procurement and inventory decisions enabling a \$70 million reduction in inventory (year on year), which has been sustained. Marketing and sales actions were also renewed to define clear growth opportunities. Training to establish the discipline and sustain this process was essential.

The logistics team looked closely at the company's delivery network and provided a 3PL solution that improved visibility of shipping costs and on-time delivery performance, in addition to providing reduced cost. An optimized asset model across various classes of equipment was utilized to uncover opportunities. As a result, a new supplier with leased assets was engaged to reduce costs and improve quality.

A consistent set of work processes and procedures were rolled out across all locations that allowed the company to easily replicate operations as they grew.

Strategic procurement was targeted to first achieve quick wins in indirect categories while simultaneously developing a long-term strategy for the tier 1 and 2 suppliers. A significant step was driving improved visibility to total delivered costs including the effect of contractual agreements. Supplier agreements were renegotiated, netting significant savings and improvements by agreeing to the best cost, quality, and delivery. This conditioned the suppliers to the new expectations of the company. In addition, the number of suppliers and products carried was reduced, which optimized savings and supported a 15 percent reduction in inventory, generating cash to fuel growth.



Mapping the end-to-end supply chain, and other business processes that impact supply and demand, is a vital step in creating an integrated system.

Additionally, synchronization of procurement, logistics and operations has been enabled by insights from big data. The ongoing cultural change has driven a new “client way” operating model to provide a foundation for profitability and growth, while also laying the groundwork for a modified service model.

Data analysts harnessed the company’s data warehouse to develop customized, real-time, and highly visual dashboards that shifted a reactive management behavior to a more predictive style of decision-making. Actionable insights into areas such as spend data, supplier performance, and inventory reporting were developed to improve strategic and tactical decision making.

Supply chain leadership focused on creating a culture of ongoing business reviews to maintain gains, align action plans, and communicate priorities. Regular strategy reviews occurred to ensure progress was being made against the improvement areas. Weekly meetings were scheduled at the operational level to review accomplishments and plan the next week’s actions (agendas, ensuring the right attendees, clear roles, right data). Monthly meetings at the leadership level with stakeholders, including equity owners, reviewed overall progress and determined actions to overcome any obstacles. These structured reviews were critical to ensure engagement with the strategic project was continuing despite day-to-day business pressures.

Improvements went well beyond the supply chain organization. The S&OP process was renewed as well. The system structure, tools, and processes were designed to focus on sales integration, transparent demand planning and robust inventory analytics across the business to address the issues with fragmented supply chains across their acquisitions.

At the corporate level, the leadership and organization improvement team developed a new staffing model with clearly defined roles and responsibilities at both the organization and individual employee level with activity-based job descriptions. As a result, 77 different job titles were condensed to just four, providing the basis to build a leadership structure with clear P&L responsibility at the district level.

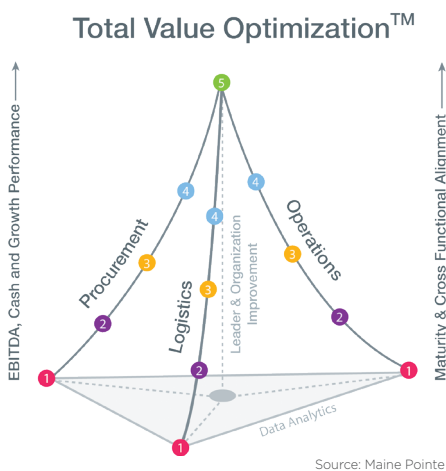
Leadership turnover had created significant uncertainty across the organization and morale was low. Organization leaders were engaged in the improvement journey. This included making improvements in their abilities to lead. Essential to this process was upgrading the company’s change management and corporate communication abilities. For sustainment, a holistic scorecard was developed to give leadership clear visibility and performance measures.

The leadership team worked with Maine Pointe to successfully improve the organization's supply chain integration effort, delivering the following accelerated results:

- \$31M in cash released in three months, with \$18M released in just eight weeks
- A sustained 15 percent inventory reduction
- Identification of an additional \$50 million in future inventory reduction with \$9 million in cash able to be generated within three months
- Implemented an organizational structure and operations model that will facilitate future growth
- Delivered 50 percent EBITDA improvement
- Achieved a consultant return on investment (ROI) of 4:1

This represents an amazing improvement in results. While not all activities in the case study were purely end-to-end supply chain integration strategy based, the majority of the best practices are critical to this story. They include:

- Proactive, personal leadership involvement in the planning, action plans, and business reviews drives results.
- Mapping the end-to-end supply chain, and other business processes that impact supply and demand, is a vital step in creating an integrated system.
- Creating a streamlined organization with clear decision making while investing in talent development is the foundation of the work.



Note: Maine Pointe is a supply chain and operations consulting firm founded in 2004 that focuses on driving excellence in procurement, operations, logistics, data analytics, leadership and organization improvement and then integrating these functions into a framework known as the Total Value Optimization Pyramid™.



*Leadership
is critical to success.*



Summary

The GSCI has redefined what supply chain integration means. Integration goes well beyond appointing a single supply chain leader, developing an organizational chart including all the supply chain disciplines, and creating a single supply chain scorecard.

Benchmark supply chains drive value by verifying all activities, and transitions in the supply chain are integrated at both a strategic and activity level.

Is an end-to-end supply chain integration strategy right for your business?

If you have complex, global supply chains, have multiple acquisitions, have significant customer service issues, or have a small pipeline of large cost savings projects, your supply chain is a prime candidate for this strategy.

This strategy is not easy. It requires:

- 100% commitment from leadership and management
- A clear supply chain vision
- Detailed supply chain work and analysis
- Potentially difficult conversations with suppliers, customers, and other partners on strategy alignment
- Elimination of sub-optimal department rewards and measures
- 100 percent employee involvement

Leadership is critical to success. Leaders must implement the above best practices and role model leadership in an integrated, end-to-end supply chain. This approach will drive top and bottom line improvement while enabling your team to understand the supply chain at a more productive level.

End Notes

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Integration Tool Kit

How to Start

“This all sounds good but how do I get started?” is a common response to the GSCI's best practice white papers. It is a great point—Initiating an effective end-to-end supply chain strategy is important and consuming leadership work. The benefit of a strong end-to-end supply chain strategy is vital to creating competitive advantage and driving value, however, and therefore worthwhile.

Our first recommendation is to follow the nine-step process outlined in the book *Supply Chain Transformation*, by Paul Dittmann.¹³ Developing an end-to-end supply chain strategy is complex and requires significant time and resource commitment.

Once you have determined that an end-to-end supply chain integration strategy is the right path, the following seven critical actions can help supply chain leadership focus their efforts.

1. Ensure that the foundational items from the GSCI supply chain improvement model are in place:

- a. Leadership, Talent, and Common Values
- b. Reliable/Predictable processes
- c. End-to-End Supply Chain perspective

2. Create a compelling business driver for Integration Strategy

Supply chain leaders must be passionate about the work and be crystal clear on the value to the business. This includes selling business leaders, commercial leaders, supply chain leaders, all supply chain employees, suppliers, customers, and external partners.

3. Map the Supply Chain

This is a significant amount of effort, but it is necessary to enable the value improvement from integration. If resources are limited, start mapping the priority areas of the supply chain (revenue, profit, waste, time, defects, volume). This prioritization can be helpful to start the work, but realize that it can be counter to an integration strategy as the weakest link in the supply chain can limit value creation.





4. Create Common Measures

When mapping the supply chain, document the performance at each node and transition. Most supply chains start by measuring cost, quality, and service at each point. The benchmark supply chains evolve to measuring time, waste, and cash at each point.

5. Drive Strategic Alignment between Nodes

If supplier/customer strategies in the supply chain are different (e.g.: one node is working throughput and the next flexibility) then drive alignment. Can the strategies be changed? If not, can agreement be reached on tactics to ensure integration?

6. Drive Operational Alignment between Nodes

Check each transition for alignment of materials, equipment, transportation, people systems, and information/decision-making. This is the heart of integration work. A sample question to ask: "If a decision is made does every node/transition in the supply chain immediately change their work to be consistent with the new direction or task?"

7. Celebrate and Fix the Integration Defects

Reward people for finding and fixing the integration defects. Leadership behavior that motivates employees to hide the defects is not productive. Publicly talk defects and how they have been resolved to motivate total employee involvement.

Acknowledgement

We would like to acknowledge our Global Supply Chain Institute sponsors, more than sixty corporations representing over \$1.7 trillion in annual revenue, and our advisory board, forty senior executive supply chain officers, for their proactive support, including networking, benchmarking, coaching, financial, and project partnerships. These leading companies are dedicated to delivering world-class supply chain innovation.

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SUPPLY CHAIN STRATEGY



A FINAL NOTE

We hope you have found the material in this white paper helpful and useful. We at the University of Tennessee's Haslam College of Business are committed to translating our top-ranked 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 sixty 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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