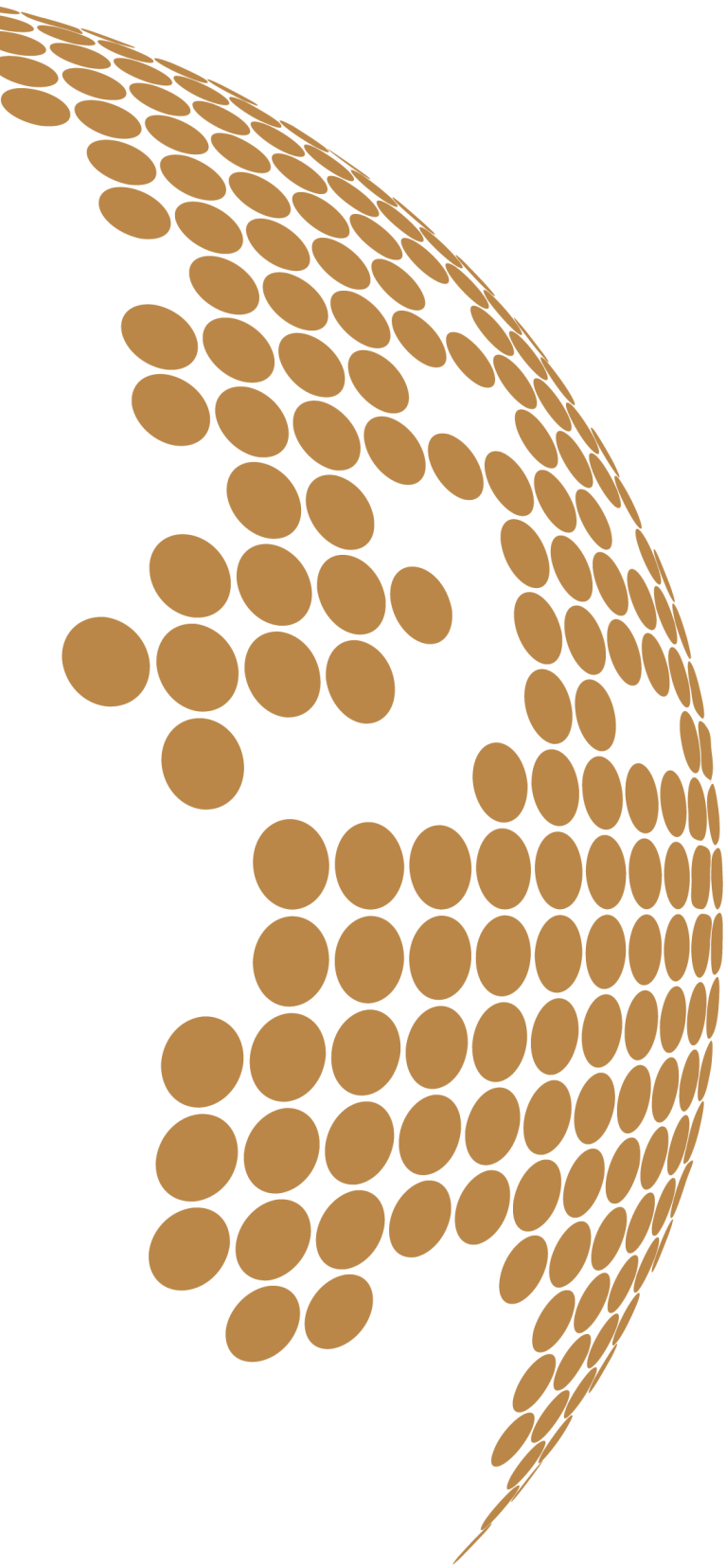

MIT CTL ROUNDTABLE SUMMARY REPORT

SUPPLY CHAIN STRATEGY: OVERCOMING NEW COMPETITIVE CHALLENGES

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Executive Summary

MIT's Center for Transportation and Logistics (CTL) convened a roundtable of 17 supply chain executives from 11 companies to discuss how companies address the challenges of supply chain strategy. The roundtable approached supply chain strategy from a pragmatic perspective: grounded in facts and geared towards action. The group discussed supply chain strategy not as an end in itself, but as a means to achieving better performance of the supply chain and of the business. To encourage more candid conversations about strategic issues, the identities of the roundtable participants were kept private in this report.

Much of the day focused on four distinct tasks related to supply chain strategy development identified by MIT and conducted by some of the companies at the roundtable. Task one is to articulate the current supply chain strategy as it is practiced. The second task is to evaluate the supply chain strategy to identify its strengths and weaknesses. The third task is to reformulate the supply chain strategy for both mid-term performance and long-term robustness. Finally, the fourth task is to implement a new supply chain strategy and monitors the results. During the roundtable, each task was described first by one company who had faced that task before, using one of MIT's techniques. This was followed by a more wide-ranging conversation from all participants based on their experiences with the issue.

Research conducted during the last decade to validate Fisher's famous matrix has shown that empirical data does not necessarily conform to that framework. Companies don't pursue purely "efficient" or "responsive" supply chain strategies based on product types, and that using a mixed strategy does not affect performance. Companies may use mixed rather than pure strategies because of the differences in supply chain needs even within a single organization. For example, all of the roundtable companies had wide-ranging product lines, had business units with different strategies, operated in diverse geographies, and had customers (or suppliers) with their own varied strategies. That diversity drove companies to a more nuanced (and flexible) supply chain strategy than was envisioned by early academic archetypes for best-practice supply chains like Fisher's type-match approach. Companies at the roundtable talked about harmonizing their processes and tools to create integration, transparency, and global management of the supply chain organization. But they also discussed customizing pieces of the supply chain to support diverse customers, regions, and products.

Overall, the companies found great benefits from using CTL's rigorous step-by-step approach to creating tailored strategies for their companies or business units. CTL's four-step method helped broaden thinking about the supply chain both within the supply chain organization and across the wider organization as a whole. The method improved communication and consensus because it created clear links between business priorities, supply chain strategy and operational execution. The four-step method emphasized articulating and evaluating the current strategy, which few companies do. Yet the roundtable participants found enormous value in evaluating current strategy first, because the evaluation uncovered conflicts and gaps between the high-level strategy statements and the drivers for operational behavior. Thus, the evaluation provided a strong consensus-building outcome that aided integration and implementation of an improved strategy.

1. Tailoring a Supply Chain Strategy

In 1997, Fisher proposed that companies should gravitate to either an efficient supply chain strategy or a responsive one, depending on the nature of their products. Companies selling functional or commodity-like products should use an efficient supply chain to match the price-sensitive nature of the company's products, Fisher recommended. Companies selling innovative products should use a responsive supply chain to match the fast-changing and uncertain demand of the rapidly-changing product space. Although the suggestion seemed intuitive at first glance, subsequent empirical research failed to validate this proposed matching. In one 2010 study, for example, not only did 78% of actual companies fail to fit into a nice clean "functional vs. innovative" product category, but 69% of companies used a mixed supply chain strategy that blended cost-efficiencies with responsiveness. This study also found that having the expected match between product type and supply chain strategy produced no financial performance benefits.

So then, how should companies design an effective supply chain strategy?

1.1. Insights from CTL Research

This question led Dr. Roberto Perez-Franco, Director of the MIT Supply Chain 2020 Project, to research how companies can design good supply chain strategies for themselves. His research led to several insights and a four-step process for strategy design. It rejects cookie-cutter solutions, since it considers there's no simple set of company types with corresponding ideal matching supply chain strategies. Instead of picking a best practice, companies must craft their own tailored practices that befit their unique situation, product mix, customer mix, and region. In fact, many of the discussions during the roundtable emphasized not just the differences between companies, but the difference in strategy needed for different parts of the same company.

Second, designing a good supply chain strategy comes down to a mid-term challenge and a long-term challenge. In the mid-term, companies select tailored practices to create a supply chain strategy that might persist for a few years. In the long-term, however, the fundamental unpredictability about forecast demand, patterns of development, macro-economic forces, new technologies, and changes in the upstream and downstream context of the company all conspire to motivate reformulation of supply chain strategy. At best, companies can be aware of future scenarios for major change and prepare themselves for those potential changes.

1.2. Four-Step Process

The necessity to formulate (and periodically reformulate) supply chain strategy led Dr. Perez-Franco to develop a four-step model that numerous companies, including companies at the roundtable, have subsequently used. In summary, the four steps are:

* Articulate the company's current supply chain strategy to understand what it has in place
* Evaluate the current supply chain strategy to understand its performance (or lack thereof)
* Reformulate the supply chain strategy to create desired improvements or align with strategic goals
* Implement the new supply chain strategy to achieve the desired performance and goals

The roundtable participants discussed each of these four steps. During each discussion of a step, one roundtable member presented his or her perspective on that step, and then everyone joined in the broader discussion of that step.

2. Step 1: Articulating the Current Supply Chain Strategy

Research by Harrison and New found that three out of five firms admit to not having a well-defined supply chain strategy in place. That doesn't mean the company doesn't have a strategy, only that it might be ill-defined or tacit in the diverse management imperatives and operating policies used by the supply chain organization. Moreover, the experiences of the companies at the roundtable suggest that some companies may think they have a well-defined top-down supply chain strategy but then discover that the company's actual operating processes or frontline personnel don't follow that strategy.

Understanding the current supply chain strategy is a prerequisite to evaluating the current strategy and reformulating it. If a company does not know what strategy it has, it can't make prudent decisions for how to change it. Moreover, given that the current strategy represents some accumulation of thoughtful action in response to changing business needs, customer needs, supplier behavior, and transportation network realities, then articulation of the current strategy helps the company understand what it is doing and why.

2.1. Gathering Data: What Is Our Strategy?

The key to articulating a company's supply chain strategy is to talk with the people who currently carry out that strategy. At the roundtable, one company summarized its process, facilitated by MIT, to articulate its current strategy. The company interviewed 20 to 30 functional leaders, asking each one about his or her perceptions of the company's supply chain strategy and core competencies. The people interviewed were drawn from operations, supply chain, distribution, transportation, and customer teams. The company wanted to document its end-to-end strategy from raw materials to the customer.

Information from the organization can then be presented in a functional strategy map (FSM), which is a hierarchical decomposition of the supply chain strategy down to supporting substrategies and operational practices. The map might have three to six layers that connect high-level strategy to lower-level policies and processes. At the top of the FSM might be a high-level strategic mandate such as "being a cost-effective provider who enables our customer companies to focus on their consumers." The next layer might have supporting substrategies, such as "deliver exceptional service" or "have a very efficient supply chain in terms of costs and capital." These might then progress down to a lowest layer that includes operational practices such as "optimal inventory" or that addresses specific cost and service levels to different customer segments. In the four-layer example shown by Dr. Perez-Franco, one top-level business strategy fed into five supply chain strategy statements, 12 mandates, and 30 executive strategy-driven activities.

Another company asked how the four-step process related to the Supply Chain Council's SCOR model. The SCOR model includes a convenient set of pre-defined supply chain processes organized into major categories (plan, source, make, deliver, and return). The company

describing its experience with the articulation step does not use SCOR formally but said that SCOR might help, especially in the later stage of developing a reformulated supply chain strategy. SCOR could help convert a new strategy to action, flesh out new or improved processes, and provide metrics for assessing performance improvements.

2.2. Supply Chain Strategy vs. Corporate Strategy

One of the earliest questions discussed by the group was the relationship between corporate strategy and supply chain strategy. Participants held divergent views on the issue. One side saw business strategy as a foundational prerequisite to supply chain strategy. It was almost a "Step 0" needed prior to even thinking about SCS. Under this view, the supply chain is a key supporter of business strategy -- a tool for implementing broader strategic business goals.

Yet others felt that the opposite should be true, namely that the supply chain should be "driving the boat." The supply chain's central role in connecting supply to demand gives it a powerful understanding of the business environment and the potential for new innovative supply chain services. If business leaders understood the full capabilities of their supply chains, then top executives they might change the business strategy to take advantage of those supply chain capabilities.

Overall, regardless of which should drive what, participants agreed that both strategies must be aligned with each other.

2.3. Using Outside Facilitators

Dr. Perez-Franco asked about the value of outside facilitation for efforts such those discussed at the roundtable. The group mentioned four advantages of using outside facilitators. First, outside facilitators often bring a framework -- and experience with that framework -- that helps structure the process. Second, they can provide discipline to a long-term project that might otherwise take a backseat to ever-present short-term operational pressures. Third, outsiders are more likely to transcend organizational politics because they are less likely to have loyalties to one business unit or one functional group. Fourth, outside experts, such as a management consulting companies (e.g., McKinsey, Bain) can provide validation and help with benchmarking. Yet facilitators may not be required if the project has a strong champion who can work across the silos.

2.4. Getting a CAT Scan, Not a Glamour Portrait

Dr. Perez-Franco said that the process for articulating a company's existing supply chain strategy is like taking a picture of the organization. In some cases, the resulting picture might not be pretty, and some might prefer a more aspirational view of current strategy. But the goal of articulation is to seek the unvarnished truth so that the company can fix it. Unless an organization knows what's not working (as well as what is working), management can't properly correct it or improve it. Having a clear picture of what really goes on leads to the next step of evaluating the current supply chain strategy.

3. Step 2: Evaluating the Current Supply Chain Strategy

The second step begins with the articulated existing supply chain strategy created by Step 1. Most of the discussion about the evaluation step concerned the criteria for evaluating supply chain strategy. These criteria are distinct from those used to evaluate operational supply chain performance because the emphasis is on the interactions of the components of the strategy rather than the outcomes of operations. The result of the second step is a diagnostic on the current strategy that can help guide the reformulation step.

Informal data suggests that many companies think they don't need to evaluate current strategy in order to craft a better strategy. Of nine companies that approached CTL for the purposes rethinking or creating a new supply chain strategy, only one wanted to evaluate their current strategy. Yet evaluation is a key part of understanding which elements of the current strategy might be working and which are in need of rethinking.

Dr. Perez-Franco urged roundtable members to think about all the criteria for evaluating supply chain strategy. What makes a good supply chain strategy? What makes a flawed strategy? It might be easy to say that a good strategy help the company perform well, but if performance is defined by strategy, then that view seems a bit self-referential or tautological.

3.1. Criterion: Alignment

Much of the evaluation discussion centered on alignment between the layers of strategic pillars, functional principles, and operational practices. A good supply chain strategy is internally consistent. Alignment can include sub-criteria such as: support (where one lower-level item helps satisfy a higher-level strategy element); compatibility (where two items on the same level don't mutually interfere with each other); and synergy (where two items on the same level do mutually reinforce each other). The company that described its evaluation of its supply chain strategy evaluated the alignment between 4 strategic themes, 8 functional themes, and 31 operating themes. They used a simple -3 to +3 scale to record the amount of alignment where -3 reflected a strong conflict and +3 reflected good alignment.

For the most part, the company found good alignment between the functional team layer and the strategic layer. But the lower layer was much less aligned. The company also found 18 conflicts between the lower-layer operating themes and the highest-layer strategic layer. For example, the company found some conflicts between its strategic pillars and the operational imperatives of the company's asset base. One of the strategic pillars called for innovation and flexibility. Yet the company has very large-scale assets. In fact, one of its key plants is so large that it exceeds the total global capacity of its largest competitor. Needless to say, that asset is not very flexible, although it is very cost efficient.

Other companies cited similar conflicts between "motherhood and apple pie" high-level strategy and the de facto policies governing supply chain operations. In some cases, the high level strategy might include aspirational elements -- how the company likes to think it operates. In other cases, the tactical requirements for winning sales and satisfying customers conflict with a lofty strategy. For example, strategy might call for protecting profit margins but a given market might require price concessions.

Many of these conflicts cited by roundtable members reflected to Fisher's original supply chain strategy dichotomy between service vs. cost efficiency. To the extent that customers demand both high service and low cost, the supply chain faces an inherent conflict. Strategic imperatives for cost efficiency can conflict with lower-level customer service demands, and vice versa. The experiences of roundtable participants echo the research results that companies seldom pick a pure strategy of only service or only cost-efficiency

Companies mentioned two approaches to resolving this service/cost conflict. The first approach is to push the envelope of supply chain performance to provide higher service at lower cost. The second is customer segmentation: providing higher service only to those customers willing to pay the added costs of service, while offering lower prices to those customers willing to accept less-responsive service. Although segmentation helps reduce the conflict, it increases complexity because different parts of the supply chain now must operate on different principles or serve two masters. In general, all these conflicts provide an obvious focus for reformulation in the next step of the process.

3.2. Other Criteria

Alignment was not the only criterion. Even if all the elements of the current strategy are perfectly aligned, there may be gaps. One type of gap-related criterion is coverage. That is, the strategy or other layers may not cover all aspects of the supply chain, leaving some elements undefined. A second type of gap-related criterion is sufficiency. That is, a high-level strategy might have insufficient supporting functional principles or operating layer elements to ensure that the strategy gets implemented.

The group also mentioned agility and adaptability as criteria for a good supply chain strategy. Any supply chain strategy must cope with changes over the tenure of that strategy. In particular, the strategy must cope with the range of possible forecast errors, which can be sizable for long-term forecasts. Agility also aids resilience when unexpected events such as Hurricane Katrina push the supply chain far outside its usual operational sweet spot. Agility and adaptability help a company handle future scenarios, which will be covered in the next section.

One participant suggested simplicity as a criterion with several benefits. First, a simpler strategy is easier to communicate across the organization, which helps ensure that the strategy gets implemented and that everyone follows it. Second, simplicity reduces the costs of complexity. Finally, simplicity supports other criteria such as agility and adaptability by enabling faster alignment during a change.

Another member noted the growing importance of sustainability, especially in Europe. Any supply chain strategy that degrades the environment or that degrades the organization's long-term abilities would not be a good strategy. Companies are adding sustainability to their supply chain strategies. For example, one company now has a strategic mandate to source only conflict-free minerals by 2013. Issues like sustainability suggest that supply chain strategy might need to align to goals and principles that come from beyond the boundaries of the organization.

4. Step 3: Reformulating a New Supply Chain Strategy

Next, the group discussed the heart of the process -- rethinking or reformulating a company's supply chain strategy. This step begins with the clearly articulated current supply chain strategy from Step 1, an evaluation of the current strategy from Step 2, and other information. Reformulating the supply chain strategy means thinking about new strategy elements, evaluating them in some way, and reaching some consensus on the strategic direction of the supply chain.

Reformulation can go many directions. A company might simply tweak its existing strategy to improve it. Or, the company might seek a more radical change by starting with a blank slate. One key insight is that a conflict or misalignment in supply chain strategy provides at least two different directions for resolving the conflict. If the higher-level strategy conflicts with some lower level functional principle or operational practice, should one change the high-level strategy or the lower-level element? Companies can also use the reformulation process to fill in gaps or address new opportunities.

4.1. Priorities: "We can do anything, but not *everything*"

One participant noted that supply chains can be reformulated to do anything, but they can't do everything to perfection. He suggested that a supply chain strategy needs to encompass four or five top priorities. This ensures that the supply chain organization knows how to allocate its resources and attention and, more importantly, knows what not to allocate resources to. Those four or five top priorities might come from the top, be driven by the customer, or define where the supply chain can add the most value. In all cases, the priorities determine which supply chain metrics the company should excel at and which ones it can be merely average on. Other companies echoed this sentiment: knowing what was good enough was as important as knowing what needed improvement.

Different companies have different priorities. To understand these priorities, one company interviewed key business leaders and asked a simple question: "What's important to you?" Of course, the business leaders asked for 20 top priority items, but the company worked to drill down on the top five that really mattered. They prioritized the items with probing comparison questions such as, "do you want EVERY case or to get it ON TIME?" Something had to be the true number-one priority. In some cases, the business didn't understand the importance of some aspects of supply chain performance, like continuous supply. So the supply chain people had to educate the business leaders on why continuous supply really was important to the customer and the end consumer.

The result was a much clearer picture of what the supply chain needed to do to add value to the organization. A supply chain value proposition with elements like assurance of supply, sustainability, easy ordering, and so forth was created. Understanding the priorities also helped with funding because everyone agreed to what was important. The exercises created a clearer ROI link between funding a supply chain strategy and achieving business performance.

4.2. Adjust or Replace?

In reformulating their supply chain strategies, companies can either adjust the existing strategy or create an entirely new strategy. The company that presented its experience with reformulating

their supply chain strategy opted for a more significant strategy makeover for two reasons. First, it felt that if it just tweaked the existing strategy, the company would risk getting stuck in short-term incremental thinking. "If you start with the old supply chain, then you look only at the next 1.5 years. It's harder to think about 3-5 years or longer out years," the participant explained. If the company was going to be serious about supply chain strategy, then it should open itself to fresher thinking. Second, the company found that their business units didn't really have a strong existing strategy. The business units had something they called strategy, but is was little more a list of activities. Thus, the company chose a more blank-page approach to reformulating its supply chain strategy.

Major changes to supply chain strategy may also be the path to out-sized returns. MIT's Dr. Jonathan Byrnes cited a GE study that found that bigger investments offer higher rates of returns. The reason for this was that small investments tended to be incremental tune-up projects. The larger investments were paradigm-changing projects.

Other roundtable members felt more comfortable with more conservative or incremental approaches. If business strategy is stable and the supply chain is performing decently, then strategy reformulation may be more about adjusting priorities, reducing conflicts, leveraging the existing assets, and continuous improvement. Although jumping to a new paradigm-changing strategy might be exciting, it's not for everyone. Being a pioneer comes with added costs and risks. Sometimes it's better to be the second player in an industry than try to be fast-first pioneer.

Evaluation criteria, such as feasibility and cost of migration depend on the internal context of the company. Dr. Perez-Franco represented these internal elements by a circle around a triangle.

The triangle is the layered pyramid of business strategy, supply chain strategy, and supply chain operations. But just as important is the existing internal context. Inside the circle and around the triangle are the supply chain assets, supply chain culture, and supply chain capabilities. The nature of assets, culture, and capabilities affect whether a reformulated strategy is feasible and how much it might cost to implement.

4.3. Three Methods for Reformulation

Dr. Perez-Franco outlined three methods for reformulation: two from the literature and one developed by CTL. The first one, created by Martínez-Olvera and Shunk, considers reformulation in terms of migration from some current misaligned state to a more aligned strategy state. The company modifies its strategy pillars, functional strategies and operational practices to align them within one of several manufacturing models (e.g., "make to stock," "make to order" etc.). Because a company might migrate its strategy in any of several directions, this method uses the cost of migration to decide the direction. That is, the company should most likely choose the supply chain strategy for the business model nearest to the one it currently has. Roberto noted that this method doesn't seem to consider the business strategy, only the manufacturing model.

In contrast, Schnetzler et al. propose a top-down reformulation process that starts with the core business strategy at the highest level and a blank sheet of paper. This method uses an axiomatic design approach that progressively cascades downward from the core strategy to define strategic themes, functional themes, and operational themes. But it entirely ignores any existing elements of the current supply chain strategy.

The third method, called Progressive Conceptual System Assembly (PCSA), was developed at MIT to remedy shortcomings of the other two models. Whereas the other two methods rely on modifying or creating new strategic themes, PCSA uses clarification and refinement of the strategic themes. At the lower levels, PCSA can either reuse elements of the existing supply chain strategy or create new elements to fill gaps or implement new business strategy directives. PCSA uses a prioritized framework of areas of interest (e.g., delivery logistics, manufacturing, partnerships, innovation, etc.) to guide a series of policy choice decisions. PCSA lets a company either create a new strategy element or reuse old ones.

4.4. Evaluating a Reformulation: Feasibility, Costs, and Value-Added

Reformulation implies re-evaluation. A company that's considering various reformulated supply chain strategies needs some means of evaluating these options. For the most part, the evaluation criteria from Step 2 can be used to think about any proposed reformulated strategies. But a company might use some additional criteria for evaluating a change or new to supply chain strategy. These new criteria evaluate the nature of the change inherent in reformulation.

In particular, a new or reformulated strategy is only good if it can be implemented. That is, a proposed supply chain strategy must be feasible. It must be possible to implement the proposed strategy with the company's available or acquirable resources.

A second, related criterion, is the migration cost. The company that presented their reformulation experience may have started with blank page on strategy but that doesn't mean they had carte blanche. They had to consider the existing supply chain and executive resources in crafting a new supply chain strategy.

Estimating the cost of migration means understanding the required change implicit in implementing a reformulated strategy. Costs mentioned at the roundtable included: new tools, training, hiring new people, and acquiring new assets. Companies can face costs from entering

new markets or exiting them. In some case, the costs of migration might be offset by sales of non-core assets. Dr. Byrnes noted that MIT teaches change management as a part of everything.

Finally, a reformulated strategy should have some business benefits. That is, a proposed reformulation should deliver higher performance on the metrics that matter to the organization. As Dr. Perez-Franco said at the outset, "we will address SCS not as an end, but as a means to achieve better performance of the supply chain." Several companies expressed this in terms of the "value added" by the supply chain to the business and to customers. In some cases, supply chain people may have to educate business units about the hidden value that the supply chain could provide.

4.5. Seeking Innovation

The roundtable touched on supply chain innovation as a part of reformulating supply chain strategy. The roundtable participants noted the difference between paradigmatic-change and the pursuit of the latest best practice du jour. Participants liked the rigorous process of carefully developing strategy as opposed to "chasing shiny balls." Yet the discussion prompted one company to wonder who were today's real supply chain innovators -- companies that were always a step ahead.

The ensuing discussion highlighted one of the reasons for the failure of the Fisher's model. A company might intentionally pick the innovation-affiliated responsive supply chain strategy despite having a cost-driven functional product as a point of differentiation. For example, one of the roundtable members said 90% of their products aren't sexy new items and there's little room for product innovation. But they emphasize responsive service because it enables higher margins. Although competitors can replicate the product, they can't easily replicate the high-service supply chain that creates a competitive differentiator. Thus, supply chain innovation can be independent of product innovation.

One key element of supply chain innovation is that supply chain innovation can depend on the cooperation of the customer (or supplier). New strategies for how goods are distributed, transported, and managed often require the collaboration or acquiescence of the party on the other end of the chain. For example, Dr. Byrnes noted that one of the roundtable members created major innovations by improving distribution inside the customer organization, not just improving deliveries to the customer's receiving dock. Thus, some supply chain innovations mean seeking out innovative customers (or suppliers) willing to try a new supply chain strategy.

4.6. The Role of External Partners

Some people wondered about the need to bring in customers, suppliers, or other external partners during the supply chain strategy process. Crucial partners in the supply chain might well have insights that impact strategy. Yet it seemed that companies relied on internal representatives of these external partners rather than inviting external stakeholders to the company's strategy development efforts. As one company put it, "most of the people at the table had lots of input from manufacturing, vendors, customers, and consultants, so it wasn't just the internal point of view but lots of value streams." In particular, people from the sales team had been doing "voice of the customer" initiatives for the past five years. External perspectives can also come from a literature review and analysis of the general business environment.

4.7. Scenarios for Long-Term Strategy Reformulation

The methods and discussions so far have focused on the mid-term strategy development. For thinking about longer-term strategy, CTL uses scenario planning. A scenario is a hypothetical "what-if" story of the future of the world or some part of it. The scenario might postulate some major trend and the societal responses to that trend which might span 5, 10, 15 years or more. Scenarios are not forecasting -- the point isn't to predict a specific future so much as it is to be ready for any future.

A company can use scenarios in its long-term strategy development efforts by exploring these diverse futures and seeking robust or contingent long-term strategies that prepare the company for an uncertain future. Long-term strategy reformulation with scenarios is a four-step process consisting of: a scenario planning workshop; a scenario generation exercise; a scenario implication exercise; and then a long-term supply chain strategy reformulation exercise.

Usually a company will consider three or four diverse scenarios at the same time. In considering how it might respond to the different scenarios, the company can uncover robust actions that work in any scenario, contingent actions that work in some scenarios but not all scenarios, and actions that perform poorly in all scenarios. CTL has used a voting scheme during scenario exercises to gauge both consensus and disagreement about the interactions between strategic decisions and scenario outcomes.

Two examples of scenarios were discussed at the roundtable. The first, outlined by Dr. Perez-Franco, was a food price scenario that centered on a hypothetical fourfold increase in food prices. In this scenario, food shortages, famines, and crop failures led to both greater poverty in the developing countries and greater regulation of global food trade. Although focused on food, the scenario parallels the likely impacts of any surge in critical global raw materials such as oil or metals. The point is that a company thinking about strategy under such a context might want to prepare for shortages, high prices, and stricter laws both as a threat to existing operations and as an opportunity to become part of the solution.

The second example, presented by one of the participants, focused on the unsustainability of the US healthcare system. Given a seemingly unbreakable trend of exponential healthcare costs increases, something major must change, but what? There might be new regulations, new complexities, new threats (counterfeit drugs), new products (e.g., cold-chain biotech drugs), or shifts in the power-balance of the industry. These scenarios, in turn, might radically change healthcare supply chains, and even change who the customer is for health industry players. The point of scenario planning is to prepare for these different potential changes and to position the company's strategy for long-term performance.

Several of the companies at the roundtable have used scenarios to help them think about robust strategy and to prepare for contingent change. One key insight from scenario planning is the need to watch the environment for evidence that one or the other of a set of scenarios is becoming more likely. This is called having "sensors in the ground." Toward this end, one of the companies maintains a supply chain trends database but also admitted that it should be watching external triggers better than it is. Another company has built a review of the scenarios into its regional meetings (about two or three times a year) to discuss what's happened, what's changed, and which scenarios have become more likely.

Companies liked the fact that scenarios help broaden a company's perspective and help executives see the changing strategic forest instead of the everyday operational leaves. To support this goal, a company often uses an outside facilitator for the scenario exercises because the facilitator brings both external environmental data and the needed process knowledge for running the scenario exercises. "By going through the interviewing and doing the scenarios, we had huge success," said one participant whose company used scenarios for long-term strategy reformulation. "Scenarios opened up their minds, saw risks, challenges, and opportunities to go for," said one user of scenarios for long-term strategic reformulation. Another user of scenarios succinctly said that if using scenarios had not been helpful to his company, they would have stopped using them.

5. Step 4: Implementing a New Supply Chain Strategy

The fourth and final step brings the reformulated strategy to fruition. To do this, the company converts the strategy into an implementation plan and uses change management techniques to transition the supply chain from the old strategy to the new one. The company then monitors the strategy's impact on supply chain and business performance. As one participant said, "Strategy starts the relay race, but operations finishes it, so what matters is the end point."

5.1. Harmonization: Using the Same Tools before Getting on the Same Strategy Page

Implementing a strategy across an organization, especially a global supply chain, requires imposing some level of common operating processes and tools on the organization. The company that talked about their reformulation efforts actually had a crucial precursor effort before they implemented a more coherent supply chain strategy. They harmonized global processes in 2010. Before having a harmonized process, the company admitted that it was struggling with communication between systems and parts of the organization. After harmonizing, having the entire organization using the same processes enabled a more effective roll-out of the new strategy.

Other companies corroborated the benefits of a shared processes and a common infrastructure. In contrast, duplication of infrastructure, multiple instances of SAP, and fragmentation left over from mergers and acquisitions are all bad. Integration is a crucial, if hard, first step to implementing a supply chain strategy. As one participant said, "the reality is if you don't have that underlying foundation, you can't optimize." Once a company has a shared IT system and common processes, they can implement a global supply chain strategy (or roll out strategy elements among the divisions where the strategy makes sense).

5.2. Strategy Teams

One participant described their company's strategy implementation process. They have a strategy team that operates on a 1-3 year timescale. Members of this cross-functional team include people from business units, sales, marketing, and others. At this company, the strategy team focuses on growth, service, velocity, and agility. The strategy team works with stakeholders to understand the relationship between supply chain performance and business

performance and to develop new strategy and new projects to improve performance. For example, they might assess what happens if they reach 90% perfect orders. The company also uses benchmarking (and outside consultants) to assess its performance relative to others so it can set reasonable performance targets.

Once the company has picked a strategic direction, they implement it. That means looking at the gaps between the current implemented strategy and the reformulated strategy. The gap analysis leads to mid-term implementation projects taking anywhere from a few months to 12-18 months. The company also looks at resource gaps, especially gaps in the capacity and capabilities of people. Part of implementing a reformulated strategy is in determining who can do what.

The same people who create reformulated strategy also lead the implementation. This ownership structure ensures continuity, enables timely adjustments during implementation, and creates a closed feedback loop between strategy development and strategy execution. The company has a strong ethos of deciding what to do, anticipating the performance outcomes, and measuring those outcomes.

The company uses a set of three steering committees to manage their supply chain. The steering committees divide the supply chain responsibilities into segments of customer fulfillment, supply (both external and internal), and outsourced services. The steering committees look at integration, return on investment, and work with their allocations of resources to their part of the supply chain. If some projects require more resources, then those incremental funding decisions are handled by an annual business summit. In addition to the annual summit, the company has quarterly meetings that can handle smaller mid-project tweaks to the implementation.

5.3. Getting from A to B: Change Management

Implementing a reformulated strategy brings change and change can be hard, especially in a large global supply chain organization. Obstacles to change abound at all levels of the organization. The P&L pressures faced by business units can be a barrier to collaboration on strategy implementation efforts. Individuals will stick to their old ways unless you take them with you. Numerous participants provided suggestions on the art of successful change, namely to pick the right battles, highlight the problems with the existing strategy, and use showcase projects to demonstrate the merits of the strategy.

To make the change from Strategy A to Strategy B, companies can make two maps: 1) the operational practices in the current supply chain strategy and 2) a map of the processes that are needed in the reformulated strategy. The differences in these two maps show the additions, modifications, and deletions of operational practices. This, in turn, defines how people in the organization should be trained and deployed to execute the new strategy. The differences in the maps may also show that the supply chain's base of assets may need to change. Some companies have used the SCOR model to help convert a reformulated strategy into reformulated processes and network design.

To motivate people to make a strategic change requires laying a groundwork of honestly articulating the current supply chain strategy. An honest evaluation of the current strategy lets everyone see the conflicts, gaps, and opportunities for improvement. With a clear view of the downsides of the existing supply chain strategy and the strategic benefits of the reformulated strategy, and strategy creators can gain top executive support and the backing of group

executives who encourage people to engage in the new strategy. The key to success, cited by one company that's implemented new supply chain strategies was: accurate planning of resources, change management, and coherent communications about the effort.

Implementing change across the organization is laborious. Rolling out a global strategy means scaling-up the practices implied by the new strategy among the people who will execute it. A supply chain strategy development effort might start with a small team, but if it must be rolled out to tens of thousands of employees, then the implementation team might need to scale to hundreds or thousands of people. For example, one company with 100,000 employees had 800-900 people on the global change project team. They used implementation techniques such as train-the-trainer to help scale the implementation across the organization.

5.4. Measure and Adapt

The final step of any implementation is measuring the results and adjusting the implementation for improvement. That is, companies close the loop on their new supply chain strategy by verifying that it delivered the expected performance and making changes to further improve performance under the new strategy. They want to know if they hit their targets and got the expected ROI. One operations-focused company especially liked the SCOR model for evaluating and benchmarking performance.

Another company noted that they, like many companies, now have massive quantities of data contained in their ERP (Enterprise Resource Planning) software system. Integrated IT architectures give global transparency onto supply chain operations and performance. This data can be mined to uncover a greater understanding of the performance of the company. This data mining is often the realm of bright young employees who use a growing array of analytics, report generation, data visualization and software to transform the data into insights.

Roundtable members enumerated three categories of metrics in assessing a reformulated strategy implementation. The first category comprises project and program management metrics that measure the timely and cost-effective completion of the strategy implementation project itself. The second category has business performance metrics, customer-facing metrics (e.g., perfect orders, order fulfillment, lead time, on-time delivery) and internal financial metrics (e.g., supply chain cost as a percentage of revenue or working capital in inventory). The third category is metrics supplied by customers -- did the customer's evaluation of the company improve? The trajectory of these metrics with respect to expectations or benchmarks drives an overall assessment of the new strategy's performance.

In some cases, a company’s performance won't be as good as expected, but that doesn't mean the reformulated strategy is bad. One company cautioned that benchmarking and obsessive measurement doesn't tell the whole story because it doesn't explain why performance is low. Companies need to do root cause analysis to understand why an implemented new strategy underperformed. The cause might be strategy, but it could also be other factors such as execution, a disconnect with the customer, or some unique contextual problem with a given region, product, or channel.

Sometimes companies do adjust their implemented strategy in response to their experience with strategy or changes in the environment. Adjustments might be caused by changing customer requirements, expansions into new markets, economic cycle changes, joint ventures, or post-

merger integration needs. For example, one company noted that it's very hard to find EH&S (Environmental, Health, & Safety) qualified warehouses in Eastern Europe. Expansion into that region might require the supply chain to develop or acquire assets it didn't have before.

6. Scope: One Company, One Strategy?

Dr. Perez-Franco posed the big question of scope in supply chain strategy. How much (or which parts) of an organization can be covered by a single supply chain strategy? Part of the original rejection of "best practice" stems from this issue that no single practice (or strategy) suffices for the entire company. This leads to the question of whether scope should be defined by product, channel, business unit, customer, region, or whether the entire company can follow one supply chain strategy. All of the roundtable companies had stories about how supply chain conditions differed markedly in different parts of their own company. One company said they need a 3-D cube of strategies to cover the various combinations of customer-specific and geography-specific strategic elements.

6.1. Regional Geography

Several companies cited major geographic differences that impacted supply chain strategy. For example, one company cited the regional differences that force differences in supply chain design and management. In Europe, the company has only two warehouses because the Europeans accept multi-day lead times. In North America, the company has seven warehouses – even though its US business is smaller than its European one -- because U.S. customers demand fast service. And the company has 15 warehouses in Asia due longer logistical distances. All of the regions have different working capital requirements, which means that no single target or benchmark can work. The point is that companies need to understand the drivers that cause region-to-region variations in the company's key metrics.

China, especially, provoked several discussions about region-to region differences. On one hand, companies said they can't maintain their global market share without doing business in China. On the other hand, companies can't maintain their US or EU-level of profit margins when operating in China. That created tension among the various performance metrics. Yet China isn't just about cost competition. Companies see China and its new industries as significant but highly speculative long-term opportunities as well.

At the same time that companies have these regional differences in supply chain strategy, they may also operate global manufacturing systems. For example, one company might have a single large plant in one region that supplies product to the world or the company might use a network of manufacturing sites that collectively supply global demand. That means that one region's supply chain, associated with that region's manufacturing systems, might be affected by another region's customers and supply chain strategy. Companies would like to leverage commonalities and create global synergies for better performance.

Others noted the value of local expertise in supply chain operations. Obviously, companies need local supply chain expertise on the downstream side to serve the idiosyncratic needs of local markets. But even the upstream side might benefit from local expertise. Even a simple commodity like sand can benefit from more regional control due to local variations in the

material and differences in the sophistication of local suppliers. Thus, companies may want to define the scope of a supply chain strategy according to the location of expertise, whether the expertise is at the local level or in headquarters.

The point is that companies need a balance between global integration and regional contextual differences. One company recommended a policy of global standards and regional execution to deal with the impossibility of either a pure global or pure regional scoping of strategy. Another company cited a similar approach by defining a set of high-level corporate principles -- something like standards but less bureaucratic -- that all units abide by. But then each unit or region has some flexibility to build their local supply chain. A third company agreed and said they found that they have about 70% commonality and 30% regional or business unit specificity. In some ways this mixing of strategy on the global vs. regional dichotomy echoes the findings that companies mix strategy on the responsive vs. cost-efficient supply chain strategy. Global business may be too complex to become dogmatic about a pure strategy on any dimension.

6.2. Product

Many of the companies at the roundtable have diverse product lines. Products may require diverse supply chain strategies due to patterns of growth, special handling, manufacturing strategies, and so on. For example, one consumer goods company has both high-value-density products and low-value-density products that require markedly different supply chain networks. The high-value-density products crisscross the globe as they move through a set of specialized high-tech manufacturing steps prior to global distribution. The low-value-density products rely on regional manufacturing and distribution that minimizes shipping distances. Somehow, the company needs to support these two very different supply chain topologies. Other common product-to-product differences included: fast-moving products vs. slow-moving products and high-margin products vs. low-margin products.

One company had a three-category product segmentation based on projected product growth. The first category of products had little variation in sales volume beyond basic GDP growth and could be served with a stable asset base. The second category comprised growth products that need growing investments to serve the growing volume. The last category had highly speculative ventures into new technologies, markets, or customer industries that the company believed could be long-term opportunities but that have many unknowns and little current-day volume. These three product types have very different risk-return profiles and needed different supply chain strategies.

New or seasonal products present a special problem for the supply chain. Although the supply chain of a company might be under an edict to support new product launches, handling new products can require a very different strategy than is used day-to-day for more established products. Three additional challenges in new and seasonal product supply chain operations are ramp-to-volume, time-definite launch schedule, and uncertainties in post-launch demand.

For example, a company might ask its stores: "How much of this limited-time product do you want?" and get a response of "I don't know." Different stores or different customers might have very different approaches to promoting a new or limited-time seasonal product. Multiply "I don't know" by thousands of stores and it's hard for a supply chain to use the same strategy as they use for the company's more established (= more predictable) bread-and-butter products.

Two companies at the roundtable faced a special challenge of having very long-lead, engineer-to-order supply chains to support client's capital projects. They face two-to-three year lead times, complex sourcing, and long gaps between the initial costing of the project and the procurement for delivery. Thus, they worry about currency and commodity price fluctuations that impact as-built cost and might even affect the viability of the project for the client. That means that that part of their supply chain must consider multi-year commodity price volatility and currency exchange rate fluctuations.

6.3. Channel and Customer

Customer-centric companies have no choice but to bend their supply chains to support the diverse needs of their customers. Most of the companies at the roundtable had diverse customers or channels. For example, some sold products to OEMs in different types of industries (e.g., automotive vs. consumer electronics). Others had customers in markedly different channels (e.g., hospitals vs. retail pharmacies). This issue led one company to now use customer requirements to drive fulfillment strategy and performance metrics. All of these variations by customer, channel, region, and product highlighted the need for a configurable supply chain -- a global toolbox that could be used to make different supply chains for different conditions.

6.4. Company Size

Although many of the participants at the roundtable were in global, multi-billion dollar firms, the participants discussed the applicability of the method to smaller companies. At one level, the methods described seemed intimidating to small companies due to the series of exercises, analyses, steering committees, and change efforts. Yet many participants felt that the methods could scale up or scale down. A smaller company with a simpler span of products and a smaller supply chain organization would require proportionally less effort to articulate the current strategy, evaluate it, reformulation it, and implement it. Dr. Perez-Franco noted that CTL had done the process with as few as eight people.

The only exception to the widespread applicability of the methods seemed to be start-ups. These smallest-of-the-small may not benefit from these methods because they often don't have (and may not need) a formal supply chain strategy. A very small and agile company may be able to make it up as it goes. Only when a company reaches a certain modest scale and level of stability do formal strategy development and implementation processes make sense.

7. Benefits of Designing a Supply Chain Strategy

Throughout the daylong event, participants mentioned the benefits they've seen from using the four-step method and thinking more rigorously about supply chain strategy. One company admitted that the articulation step was a painful and tedious process, but that it played a crucial role in getting people to think through supply chain strategy and to reach a consensus on a new strategy. A second company also said that having to structure their thinking was a difficult process but created hugely helpful insights. The participant noted, "Once it (supply chain strategy) is articulated on paper, you have 90% of answer: seeing what you say you do and what the conflicts are."

Most of the benefits seem to stem from the integrative nature of the four-step process. Bringing strategy-related information and cross-function people together helped broaden thinking. A more formal process aided consensus-building and then implementation. The method enabled communication and coordination of the new supply chain strategy. In short, the four-step process improves supply chain integration.

7.1. Seeing the Bigger Picture

The participants described three ways that their supply chain strategy reformulation effort helped broaden thinking about the supply chain in their companies. First, it broadened thinking by supply chain people by uncovering the relationships (including conflicts and gaps) that link supply chain strategy to operational activities. Articulation and evaluation helps show "why" the organization does what it does. Second, it helped broaden the scope of the supply chain itself by revealing people who don't know they are part of the supply chain but they are. Third, it broadened the thinking of non-supply-chain people by helping them understand what the supply chain does and what it could do -- creating a "wow, you do all that" moment. Fourth, bringing in outside experts (e.g., MIT) helped broaden thinking about divergent possible futures of different scenarios. Thinking rigorously and end-to-end helps more people see more aspects of supply chain strategy.

7.2. Reaching Consensus and Coordination

In addition to broadening thinking, the process helps people converge on a consensus because they can see how the pieces should fit together. This helps in coordination because more people can see and agree on strategy and its implications. The formal strategy development efforts helped broaden the consensus on the new strategy. One company admitted that it felt too vulnerable to changes at the top and saw these methods as a way to create a robust and stable consensus on strategy. A rigorous and documented process could help avoid capricious redirection due to hallway conversations and chasing "shiny balls," as one company put it.

7.3. Driving Change

Dr. Byrnes wondered what it took to create high-level change whereby the supply chain could play a more central or driving role in the organization. One suggested approach might be to deftly handle a crisis that gets supply chain executives invited to the table where they can prove their long-term value to the organization. Two companies suggested that a more reliable approach is to translate the language of supply chain performance to the language of bottom-line performance. That is, supply chain executives needed to translate supply chain metrics (e.g., delivery reliability) that most non-supply chain executives don't care about into P&L metrics that business units and higher-level executives do care about. That is, supply chain people need to learn the language of business. The strategy development steps discussed at the roundtable can help because they explicitly connect high-level business strategy to the elements of supply chain strategy.

7.4. Goal: Tighter Integration Drives Higher Performance

Dr. Perez-Franco cited research by Frohlich and Westbrook that found that companies with integrated supply chains have higher market share, profitability, and return on investment. Integration may be hard, but it's worth it. The roundtable participants liked the rigor of the four-step method and the ability to get everyone on the same page. With these methods, companies have integrated the supply chain into the business and linked supply chain operations to supply chain strategy, which is in turn linked to business strategy.

The methods discussed at the roundtable provided a way to create this integration. Articulation pulls in strategy and operational facts from across the organization. Evaluation finds gaps in the integration of supply chain strategy in the form of conflicts and insufficient coverage. Reformulation creates an integrated strategy, and implementation rolls it out across the organization. The result fosters integration of all the teams inside the company: supply chain, product, channel, IT, transportation, and so forth.

Rather than pick best practices from the latest management guru, companies get their own tailored practices that fit their complex context of regional, customer, product, and business unit realities. By looking at what people are doing and why, the organization gains a better appreciation of what can be global and what must be local -- a rational approach to avoiding unnecessary complexity while supporting necessary complexity. In the end, the result is a more integrated supply chain with a more coherent rationale for its functional principles and operational tactics. In turn, when an organization knows why it does the things it does, it can do them much more effectively.