



ACHIEVING SUPPLY CHAIN INTEGRATION

CONNECTING THE SUPPLY CHAIN INSIDE
AND OUT FOR COMPETITIVE ADVANTAGE

CHAD W. AUTRY, PhD | MARK A. MOON, PhD

Achieving Supply Chain Integration

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Out for Competitive Advantage

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This book is dedicated to those, both past and present, who have been a part of the family that we call the Department of Marketing and Supply Chain Management at the University of Tennessee, Knoxville's Haslam College of Business. This turns out to be a pretty large family, and it consists of several categories:

- *The faculty.* Throughout the 50+ years that Marketing and Supply Chain Management have resided in the same department at UT, a parade of smart, insightful, and dedicated scholars have passed through and contributed to the ideas articulated here. Particular dedication to Dr. John T. (Tom) Mentzer, who encouraged us to think about integration.
- *The students.* Our undergraduate, master's, and PhD students want to know how they can be successful, as businesspeople or as scholars. They have pushed us to get deeper into the concept of integration and help prepare them to overcome the negative consequences of functional silos.
- *Our industry partners.* At the time of this writing, there are 65 companies who belong to our Supply Chain Forum. They support us financially, but even more important, they talk to us about the challenges they face every day in a dynamic global business environment. Many of those challenges turn out to be challenges surrounding integration, and they have pushed us to find useful, actionable solutions.

So we dedicate this book to this UT family. We also personally dedicate this book to our own families—the Autry and Moon families—who support and love us, and who are ultimately the reason we get up and come to work every day.

Chad Autry and Mark Moon
October 2015
Knoxville, TN

Contents

	Preface	viii
Chapter 1	Integration: What It Is, What It Isn't, and Why You Should Care	1
	Integration and Supply Chain Management	4
	What Factors Lead to Integration?	6
	What Are Integration's Performance Implications?	7
	Solidifying Our Understanding of Integration.	8
	Toward Consensus on Cross-Functional Integration	10
	Extending Previous Definitional Work on Integration.	15
	Planting the Seeds for Integration	18
	Tools Available to Managers.	21
	Conclusion.	24
	Endnotes	25
Chapter 2	Bridging the Integration Gap	27
	The Difficulty in Integrating	30
	Interfunctional Bias	31
	General Methods for Overcoming Conflict Within Integration	32
	Interest-Based Problem Solving and Collaborative Communication	35
	Conclusion.	45
	Endnotes	46
Chapter 3	Maximizing Organizational Value Creation Across the Great Divide	47
	The Demand and Supply Integration Journey	50
	Four Examples of the DSI Journey.	53
	Managerial Implications.	68
	Conclusions.	75
	About the Research	75
	Endnotes	77

Chapter 4	The Role of Information in Internal and External Integration	79
	The Importance of IT Infrastructure Integration to Supply Chain Effectiveness.	80
	The Role of Operating Models in Relation to Integration	82
	Conclusions.	85
	Endnotes.	88
Chapter 5	Bending the Chain: Deriving Value from Purchasing-Logistics Integration	89
	The Surprising Challenge: Purchasing and Logistics Integration	93
	Supply and Demand Disconnects	96
	The Research: Linking Purchasing and Logistics Integration (PLi) to Improved Functional and Financial Performance	98
	Best Practices	107
	Seven Actions a Supply Chain Leader Can Take Today.	118
	How High Is Your PLi?	120
	Endnotes	122
Chapter 6	Getting Aligned: The Benefits of Integrating Market, Environmental, Social, and Political Strategies Within the Organization	123
	How Do Executives Engage in Strategic Management?.	125
	The Alignment Framework	127
	Applying the Alignment Framework	129
	Integrating Market and Nonmarket Strategies	136
	Conclusion.	144
	Endnotes	144
Chapter 7	Achieving Demand and Supply Integration	147
	The Idea Behind DSI	148
	How DSI Is Different from S&OP	149
	Signals That Demand and Supply Are Not Effectively Integrated.	151
	The Ideal Picture of Demand and Supply Integration	152

- DSI Across the Supply Chain 157
- Typical DSI Aberrations 160
- DSI Core Principles 164
- Critical Components of DSI 166
- Characteristics of Successful DSI Implementations 172
- DSI Summary 175
- Endnotes 175

- Chapter 8 Sell Right, Not More: Leveraging Internal Integration
to Mitigate Product Returns 177**
 - A Returns Management Overview: Inspiring Internal
Integration 178
 - The Challenge of Managing Returns 190
 - Thoughts and Observations 200
 - Endnotes 201

- Chapter 9 Supplier Integration via Vested Relationships 203**
 - The Sourcing Continuum 204
 - Seven Sourcing Business Models 210
 - Supplier Integration via Vested Relationships 226
 - Conclusion 234
 - Endnotes 235

- Chapter 10 Raw Material Feast or Famine: Integrating Supply
Networks to Overcome Resource Scarcity 239**
 - Supply Risk—It Is There, Whether You Manage
It or Not 241
 - Understanding the Network of Risks 242
 - Managing the Network of Risks: Detection,
Mitigation, and Recovery 243
 - Integration as an Enabler of Continuity and
Resiliency 248
 - A Network Approach to Managing Supply Disruptions
Through Integration 253
 - Natural Resource Scarcity and the Dynamic Global
Supply Network 260
 - Conclusion 264
 - Endnotes 265

Chapter 11	Integrating Ideas and Environments: Blending Marketing Strategy with Context for Organizational Success	267
	The Study: Integrating Marketing Strategy with a Firm's Internal and External Conditions	273
	Conclusion.	293
	Endnotes	294
Chapter 12	External Barriers to Integration: Tearing Down the Walls.	297
	Conceptualizing Integration.	300
	Defining the Types of Barriers.	302
	Concluding Thoughts	311
	Endnotes	312
	Index.	313

Preface

It was about 50 years ago, in the mid-1960s, that the dean at what is now the Haslam College of Business at the University of Tennessee decided that he had too many direct reports and that there was too much money being spent on administration in the College. His answer was to take two of the College's academic departments and combine them into a single department. Thus, the Department of Transportation and the Department of Marketing joined together to become the Department of Marketing and Transportation. In the ensuing 50 years, the name of the department morphed into Marketing, Logistics, and Transportation, then again to Marketing and Logistics, and finally to Marketing and Supply Chain Management, which is what we call ourselves today. The organizational restructuring achieved what the Dean hoped—it made the College a little more streamlined and saved some cost in administrator salaries. What he didn't foresee was the strategic “aha” that has evolved over the past half-century in which the faculty of that department have come to embrace the concept of “integration” across functional boundaries.

That strategic “aha” was really inspired by Dr. John T. (Tom) Mentzer, who joined the faculty as Harry J. and Vivienne R. Bruce Chair of Excellence in Business in 1994. Tom Mentzer was a unique scholar in that he was extremely prominent in two separate fields: Marketing and Logistics (later Supply Chain Management). He was at various times in his career the president of *both* the Council for Logistics Management (now the Council for Supply Chain Management Professionals) *and* the Academy of Marketing Science. His larger-than-life personality, and the force of his convictions, helped our department to see the synergy between Marketing and Supply Chain Management, and thanks to his leadership, we developed a vision of business practice that we refer to as *demand and supply integration (DSI)*. Tom helped us get started developing this vision, and

since his untimely passing in 2010, those of us who remain at Haslam have continued to develop and refine this DSI vision. We've written articles, both academic and practitioner-oriented, that articulate our thoughts about how demand (sales and marketing) and supply (supply chain) need to be integrated through culture, processes, and tools, for the betterment of the enterprise as a whole.

But we've also come to realize that cross-function integration extends beyond DSI. It includes integration between demand-side functions, such as sales and marketing. It includes integration between supply-side functions, such as procurement and logistics. It includes integration among various supply chain partners in an inter-enterprise context. And it includes a variety of other instances where multiple entities can—and should—behave as a single entity in the pursuit of a common goal. Various UT faculty members, their colleagues at other universities, and their doctoral students have examined elements of integration in the form of articles, books, and even doctoral dissertations. Indeed, “integration” has become a theme of our research over the past several years. As a group, we've uncovered a lot of interesting and useful insights about what integration actually is, how integration can be achieved in complex business organizations, and what the benefits of integration can include.

This focus on integration at the Haslam College of Business, then, is the impetus for this book. We sat back and watched our colleagues do some highly impactful work in this area, and we've done some impactful work ourselves. We came to realize that it was time to bring this work together into a single volume that can help guide practicing business executives through some of the challenges they face in business integration. We approached our departmental colleagues, both on the Marketing and the Supply Chain sides of the department, and asked them to contribute chapters that addressed various aspects of business integration. The result is the 12 chapters found in this volume. These 12 chapters are divided into three subsections: The Foundations of Integration, Internal Integration, and

External Integration. Contributors include faculty from the Department of Marketing and Supply Chain Management at Haslam, faculty from other departments in the College who are also interested in issues surrounding integration, and current and former students who have embraced elements of integration as the focus of their work. We hope that the reader, whether that reader be a practicing business manager who struggles with functional silos and lack of integration, an academic who is interested in pursuing related issues surrounding integration, or a student who would like to learn about the benefits of creating and maintaining an integrative enterprise, will find nuggets of insight and value in these chapters.

So with all that said, let's get into it. We hope you enjoy this exploration through the world of business integration. If you find things you don't like, or don't agree with, or are simply wrong, let us know. Or if you find yourself shouting "Amen!" at anything written here, let us know that too! And Go Vols!

Chad Autry and Mark Moon
October 2015
Knoxville, TN

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Dr. Chad W. Autry is the William J. Taylor Professor of Supply Chain Management in the Haslam College of Business at the University of Tennessee. Dr. Autry's professional background includes several years' experience in retail and restaurant operations management. He has worked with and for numerous professional, civic, and governmental organizations related to supply chain process improvement, and has served in leadership positions for the Council of Supply Chain Management Professionals (CSCMP), on the national Board of Directors of the Warehouse Education and Research Council (WERC), and on the local board of the National Association of Purchasing Managers (NAPM).

Dr. Autry's research focuses primarily on socially responsible and collaborative interfirm and interfunctional relationships, their integration within and across firms, and the technological and social issues that support connectivity across multiple organizations simultaneously. He is author of over 70 research studies published in academic and professional outlets including the *Journal of Business Logistics*, *Journal of Operations Management*, *Journal of Retailing*, *Journal of Management*, *International Journal of Logistics Management*, and *Strategic Management Journal*. He is a co-author of the recent book, *Global Macrotrends and Their Impact on Supply Chain Management*, published by Pearson/Financial Times Press.

Dr. Autry is Editor in Chief of the *Journal of Supply Chain Management* and serves as Associate Editor for the *Journal of Business Logistics*, *Decision Sciences Journal*, and *Logistique' Management*, in addition to editorial board responsibilities for several other academic and managerial publications.

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1

Integration: What It Is, What It Isn't, and Why You Should Care

**By Mark A. Moon, Chad W. Autry,
and Daniel A. Pellathy¹**

Prior to the Industrial Revolution, business organizations were far smaller and simpler than they are today. Most businesses, such as family farms, merchant trading rooms, and artisan workshops, were owned and operated by a close-knit group of individuals who sold their goods and services to others within a local community. People specialized in a single trade or craft, exchanged their outputs with others who lived and worked nearby, and sought mainly to provide for family necessities. However, three key innovations that together characterized the Industrial Revolution shifted this model of economic behavior dramatically. The simultaneous emergence of mass manufacturing, long-distance communications, and mechanized transportation threw open the doors to larger and more geographically dispersed consumer markets, providing entrepreneurs who were able to scale up their operations the opportunity to vastly increase their wealth. Business leaders quickly grew their small shops into large, diversified organizations aimed at capturing new demand on national, and later international, markets. The sky was the limit.

To accommodate these revolutionary market shifts, businesses added assets, people, and capital, creating complex multifunctional organizations. Whereas before a few people performed all the tasks required of a business, now entire workgroups were formed to handle

the various activities involved with purchasing raw materials, manufacturing and shipping goods, and selling products. The best thinking at the time, exemplified by Adam Smith's widely read treatise on the division of labor, held that organizational performance was maximized by increasing specialization around different activities in the firm. Consistent with this logic, business leaders pushed different functional areas to focus on their particular part of the process, reasoning that by optimizing each set of activities in isolation they could maximize the performance of the organization as a whole. In short, the *era of specialization* was upon us. Moving from a scenario in which everyone did everything to one in which people specialized in different functional activities unleashed massive efficiency gains for early industrial organizations.

The problem is that the times have changed, but the thinking has not. The notion that if each division does its part to the very fullest, the entire organization is sure to succeed still dominates business thinking to this day. We find it in nearly every organization: sales should be the exclusive domain of the sales force; nobody but the accounting group needs to review or understand the financials; manufacturing should worry only about producing finished goods as efficiently as possible. Hire the best talent for each group and focus them on executing just those tasks assigned to their unit. The logic is simple but deeply flawed in today's dynamic market environment.

Research by business scholars in the fields of operations, marketing, and supply chain management points to the conclusion that greater specialization is no longer the engine of growth it once was. Indeed, time and again over the past 30 years, researchers have found tremendous costs associated with the strict specialization paradigm. This "dark side" of overspecialization emerges (a) when activities and priorities in one area become disconnected from activities and priorities in other areas, and (b) when different functional areas lose visibility on the unique value they contribute to their end customer.

The results are wasted resources, internal conflicts, and dissatisfied consumers.

Everyday examples abound. Take, for instance, the all too common practice of salespeople overstating their demand forecasts to ensure product is available for their customers. The result: increased inventories that tie up working capital. Salespeople might be happy, but chances are the enterprise as a whole suffers. Or consider the example of a firm's operations group deciding to source low-cost components halfway around the world. Good for keeping costs down, maybe. But what happens when the firm needs to respond quickly to changes in the marketplace? The operations group may be optimizing on their goal of low unit cost production, but achieving that functional goal may not be in the best interest of the enterprise as a whole. The list of examples goes on. Yet an overemphasis on specialization persists, rooted in people's tendencies to focus on the work at hand and management's tendency to incentivize them on the same. Over time, attending to functional metrics creates the mindset that anything happening outside the business unit is an interference or potential threat. Managers' willingness and ability to cross functional boundaries to maximize organizational performance disappears. And the efficiency gains produced by specialization are quickly outweighed by the loss in effectiveness produced by the disconnect among functions and with customers.

The point is this: if a company is going to succeed in today's dynamic environment, specialization can be only part of the equation. All the parts of the organization that were originally segmented for the sake of efficiency have to be put back together in a way that maximizes customer outcomes and increases profitability. In short, the internal and external functions of a business must become *integrated* for the enterprise to stand a chance. But what does integration entail? The rest of this chapter aims at unpacking this sometimes ambiguous term and pointing the way toward achieving its benefits.

Integration and Supply Chain Management

Integration is at the core of supply chain management. Foundational research in business management had established that optimizing decisions locally within functional areas could—and most likely would—result in suboptimal outcomes for the organization as a whole. Scholars applied this insight in the fields of purchasing, manufacturing operations, and logistics management, spawning what today is recognized as the supply chain field. The centrality of integration is apparent in the earliest definitions of supply chain management, such as the one offered by Oliver and Webber.

[SCM] views 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 require[s] a new approach to systems: Integration, not simply interface, is the key.²

Likewise, highly influential frameworks offered by Cooper and Mentzer emphasize the importance of integration. Cooper, for example, defined SCM as the “integration of business processes” across key functional areas,³ whereas Mentzer saw SCM as “the systemic, strategic coordination of the traditional business functions and the tactics across these business functions.”⁴ More recent reviews of the literature have found that integration both within and across organizations is common to nearly all definitions of supply chain management. This emphasis on integration is also reflected in the practitioner community, where the Council of Supply Chain Management Professionals defines SCM as “an integrating function with primary responsibility for linking major business functions and business processes within and across companies.” Investigations into the ways in which integration could be exploited for competitive advantage have also played a significant role in supply chain research. The centrality of integration

to supply chain management has even prompted some scholars to suggest it as the field's defining concept.

Given its theoretical and practical importance, it is not surprising that integration has received a great deal of scholarly attention, with the majority of the research seeking to establish its performance benefits. Indeed, empirical evidence gathered over many years suggests that positive associations between integration and various types of business performance do exist. Anecdotal evidence from practitioners has validated these findings over time.

Yet, despite the importance of integration, researchers and practitioners continue to report that companies find it very difficult to achieve. Business practitioners are, if anything, more keenly aware than ever of the benefits of integration, but at the same time, they report that their ability to integrate across key functional areas has not improved meaningfully as knowledge about the subject has grown.⁵ This is plausibly due to conceptual issues regarding what scholars and practitioners mean when they use the term “cross-functional integration.”

Supply chain management researchers have adopted a variety of perspectives when defining integration and its dimensions. Some researchers have emphasized and studied singular aspects of integration, such as collaboration, interaction/communication, or coordination, whereas others have tried to combine more than one of these terms when conceptualizing integration, such as blending interaction/communication and collaboration, or communication and coordination, within a single concept. Still others have used the term *integration* without specifying integration's “ingredients,” creating a catchall phrase that does little to illuminate the more basic concepts that underlie it. As a result, although a key role of scholars within an applied field is to “separate truth from hype,” the truth is that scholars have tended to characterize integration in wildly inconsistent ways that are often incompatible with the activities that occur in practice. This lack of a unitary understanding of integration, and the related

inability to reliably measure and study it, has served to undermine the best efforts of practitioners and scholars to study the concept or put it into practice. Thus, there remains a compelling need to (1) better define and operationalize the integration concept and (2) advance understanding of the factors that enable companies to successfully develop and maintain integration.

Accordingly, an initial step is to develop a complete understanding of what integration entails. By clearly defining integration and its underlying dimensions, and articulating their relationship to other concepts that serve as antecedents and outcomes, this chapter seeks to provide a solid foundation for scholars and practitioners seeking clarity on this important topic.

What Factors Lead to Integration?

Although rigorous research on integration has not been lacking, the majority of it has focused on the influences of environmental factors that precede or predict integration. Such predictive factors have included environmental variables such as uncertainty, as well as several internal organizational facilitators, such as firm strategies and structures. From the perspective of most managers, however, environmental and/or organizational factors represent institutional constraints rather than decision variables; they impact the firm's ability to integrate, but are largely uncontrollable by managers even in the long run. Thus, the existing research on environmental/organizational antecedents has provided little guidance to managers as to actionable steps that are under their control and that would promote integration in the context of day-to-day operations. This failure on the part of the academy to identify more prescriptive models (to date) has placed managers in the unenviable position of being tasked with developing and maintaining integration with little or no guidance on how to achieve it.

As a result, a young but growing stream of research has begun to focus more intently on how managers can achieve integration across the supply chain by exploring its behavioral antecedents. Behavioral antecedents include the attitudes, behaviors, and decisions exhibited by managers and other employees within the context of day-to-day business operations. Behaviors that appear to enable integration include, for example, demonstrating a cooperative attitude, engaging in informal communication across functional boundaries, gaining an understanding of other functions' activities, and being flexible in decision making. Such behavioral antecedents capture the basic attitudes and actions of individual supply chain professionals and reflect their impacts on the difficult task of achieving integration in a given context. In this sense, behaviors can be thought of as a form of the "soft skills" that have often been identified in the practitioner literature as a critical component for supply chain success, but how they impact the integration of the supply chain remains poorly understood.

What Are Integration's Performance Implications?

The preponderance of the integration literature has sought to establish its performance benefits. Flynn succinctly paraphrased the basic theoretical argument underlying these studies:

[I]nternal integration recognizes that different departments and functional areas within a firm should operate as part of an integrated process. Because internal integration breaks down functional barriers and engenders cooperation in order to meet the requirements of customers, rather than operating within the functional silos associated with traditional departmentalization and specialization, it is expected to be related to performance.⁶

Scholars have related different forms of integration to improvements in operational effectiveness and efficiency, financial performance (particularly return on assets), successful new product development, customer satisfaction, and market share. Additionally, a growing stream of research also looks at the role of integration in achieving social, environmental, and ethical goals.

Studies on integration have been carried out in a variety of inter-functional contexts. For instance, studies have assessed the integration of purchasing and operations, operations and marketing, and logistics and marketing. These studies have also been carried out across different industries and countries. Positive outcomes discovered across these different contexts bolster the view that integration is indeed linked to performance, and Leuschner⁷ and Mackelprang's⁸ recent meta-analytic reviews of the empirical evidence support a transcendent linkage.

Solidifying Our Understanding of Integration

Still, despite these seemingly positive results, research on integration remains challenged in two fundamental areas: first, despite the consistency in results, the literature exhibits a stunning lack of cohesion in deriving a consensus definition of integration. This situation has yielded a plethora of operational measures of the concept, which constrains the ability of studies to offer truly generalizable results for practitioners and scholars to rely on. Authors have used several related (yet nevertheless distinct) terms to encapsulate integration, including coordination, collaboration, cooperation, “working together,” interaction, and information exchange/dissemination. However, a noticeable lack of attention to the similarities and differences across these terms has led researchers to define and operationalize integration in ways that are generally inconsistent.

For instance, some authors have defined integration in terms of coordinating activities across functional areas, and others have placed greater emphasis on the collaborative efforts needed to maintain common goals toward which activities are directed. Still others have used the terms “coordination” and “collaboration” interchangeably to define integration. Likewise, researchers have used terms such as “information exchange,” “information dissemination,” and “interaction” to describe integration. Researchers have used these terms generally to cover aspects of both formal information exchange processes and informal communications across functional areas. However, specific definition of variables has ranged from the extent to which information systems are integrated, to whether information is generally shared across functions, to the frequency or amount of communication, to the extent to which there is a common understanding of information. Moreover, there are indications in the literature that at least some of the more formal aspects of basic information exchange, such as having an integrated information management system, may play an antecedent or moderating role in relation to integration rather than constituting one of its dimensions.

The lack of a comprehensive definition of integration and the consequent lack of a reliable operational measure of the concept constrain studies on integration from offering broad-based and generalizable results for both practitioners and scholars. Researchers Frankel and Mollenkopf describe the situation in this way:

Cross-functional integration (CFI) seems to be one of those notions that we all ‘know it when we see it,’ but there does not appear to be a consensus about what integration really is... [T]he construct must be clearly defined in order for research results to be meaningfully interpreted across the many streams of literature that include notions of CFI... [A]lthough the concept of CFI has been around for decades, scholars are still in the early stages of genuine construct development.⁹

Toward Consensus on Cross-Functional Integration

Strong conceptual definitions, particularly of established concepts, must be grounded in research. Thus, a comprehensive definition of integration would have to include elements of the multiple perspectives outlined earlier. As such, we propose the following definition of integration:

Integration is an ongoing process in which functionally diverse areas of an organization collaborate, coordinate, and communicate to arrive at mutually acceptable outcomes for their organization.

According to this definition, integration is conceived as a multidimensional concept that combines elements of collaboration, coordination, and communication. Functional diversification is conceptualized as antecedent to integration; that is, diversification represents the assumed state in which the integration of goals, activities, and knowledge occurs. Likewise, “mutually acceptable outcomes for the organization” are seen as the result of integration, rather than as a dimension of the concept. Definitions of the concept’s three dimensions—cross-functional collaboration, cross-functional coordination, and cross-functional communication—are important for completely understanding the phenomenon of integration as it exists in modern business organizations.

Cross-Functional Collaboration

Collaboration generally refers to the mutual establishment of the goals and processes that govern a joint effort. Collaboration represents a special case of the more general concept of *cooperation*. Cooperation can be said to occur in a multi-agent system when (1) agents have a goal in common that no agent could achieve in isolation, (2) agents act to achieve that goal, and (3) agents perform actions that

enable or achieve not only their own goals, but also the goals of other agents. Thus, cooperation is centrally concerned with how agents prioritize their own actions with reference to individual and joint goals. It entails not taking advantage of other agents who behave cooperatively. Cooperative agents are therefore willing to make decisions that may suboptimize individual goals in furtherance of a joint goal on the understanding that other agents in the system will behave likewise.

Cooperation incorporates more general ideas found in the integration literature, such as “working together.” Note, however, that cooperation does not imply *coordination* (discussed later), insofar as agents can act toward a common goal without any explicit sequencing of decisions or actions. Yan and Dooley make this distinction in arguing that “integration encompasses coordination (alignment of actions) and cooperation (alignment of interests).”¹⁰

Integration, however, goes beyond simple cooperation to include cross-functional *collaboration*. Collaboration includes working toward common goals, but also entails an ongoing process of establishing those goals and maintaining joint agreement on how best to achieve them. Thus, participants integrate individual goals by negotiating a mutual understanding of group objectives and the role each participant plays in achieving those objectives. In the supply chain context, “collaboration facilitates an assessment of the state of the supply chain, of the needs of the organization, and the determination of an approach for creating and sustaining value based on that collaborative assessment.”¹¹

Collaboration represents an often difficult process of resolving conflicting interests to establish a joint plan of action with few enforcement mechanisms beyond voluntary agreement. It therefore requires functions to develop meaningful relationships based on trust and mutual respect. It also entails an appreciation of the unique constraints faced by the participants, and may therefore include sharing resources, ideas, and/or information to overcome such constraints. Stank characterizes collaboration in the following way:

Collaboration depends on people's ability to trust each other and to appreciate one another's expertise. It is a voluntary process where two or more departments work together, share resources, and seek to achieve collective goals. It is fundamentally a process that cannot be mandated, programmed, or formalized. Collaboration emphasizes cooperation and is very much 'contingent upon the ability of individuals, scattered within and across organizations to build meaningful relationships.'¹²

At its best, collaboration allows functions to continuously align individual and common goals as they seek to meet the demands of dynamic environments. Based on this understanding, the following definition of cross-functional collaboration is proposed:

Cross-functional collaboration is an ongoing process of jointly defining, adjusting, and working toward common goals while maintaining mutual agreement on how best to achieve them.

Cross-Functional Coordination

Coordination represents a distinct but related concept to collaboration. Whereas collaboration defines common goals, *coordination* refers to the process of bringing together the contributions of constituent members in a way that attempts to consciously optimize a given goal. More colloquially, coordination is determining "what happens when" in achieving some objective. Thus, the central aspect of coordination is the integration of interdependent activities. But, in the context of integration, coordination specifically refers to the process of ordering functional activities—in terms of both substance and timing—so that process inputs and outputs are matched with maximal efficiency. The concept encompasses terms such as "synchronization" and "seamless supply chain operations" insofar as they also relate to inventory control and waste reduction. Germain and Iyer, for

example, emphasized coordination in defining integration as the “unified control” of successive supply chain processes aimed at streamlining operations, reducing bullwhip effects, and efficiently matching supply to demand.¹³

Coordination is based on a systems view of the supply chain that sees functional activities as part of ongoing process flows. It may entail, for example, the use of advanced planning systems that employ optimization and metaheuristic approaches to find systemwide solutions or liaison personnel whose specific job it is to coordinate the efforts of several departments. It is important to stress that the concept of coordination presumes a predefined goal. As Oliva and Watson point out: “Coordination...should be considered different from integration in that where coordination takes the target for granted, integration often involves determining this target simultaneously with the aligning of allocation decisions.”¹⁴ Based on this understanding, the following definition of cross-functional coordination is proposed:

Cross-functional coordination is an ongoing process of ordering supply chain activities across functional areas based on a systemwide approach that attempts to consciously optimize a given goal.

Cross-Functional Communication

In general, any definition of communication needs to specify (1) what constitutes a communicative act, (2) whether the intention of the sender is considered, and (3) whether the evaluation of the communicative act by the receiver is considered. In the context of integration, communicative acts can take the form of both structured information exchange processes and informal interactions across functions. More importantly, however, the content of these communicative acts represents some tacit and/or explicit knowledge that resides within the sender function. For instance, Mollenkopf refers to information

dissemination across marketing and logistics in terms of information regarding products and target customer segments (from marketing to logistics) and warehousing and transportation issues (from logistics to marketing).¹⁵ Other authors have likewise specified the content of communicative acts in terms that indicate the transference of knowledge from one functional area to another. Thus, in the context of integration, a communicative act is not simply the exchange of data or even face-to-face discussions by cross-functional teams; rather, a communicative act is the transfer of knowledge housed in one functional area to other areas of the firm.

Within a supply chain context, moreover, arriving at a shared interpretation of transmitted knowledge is critical to planning and implementing a collective response to the business environment. Thus, the intention of the sender (what the communicative act was meant to communicate) and the evaluation of the receiver (how the communicative act was interpreted) also play an important role in defining cross-functional communication. Indeed, researchers have specifically considered the importance of sender intention and receiver interpretation to integration. More broadly, several research papers have highlighted the need for mutual understanding as a critical element in cross-functional communication. Based on this understanding, the following definition of cross-functional communication is proposed:

Cross-functional communication is an ongoing process of transferring knowledge from one functional area to other areas of the firm so that a mutual understanding of the relevance of the knowledge is achieved.

Extending Previous Definitional Work on Integration

The definitions offered here seek to synthesize previous theoretical work aimed at conceptualizing integration while adding clarity to the terminology employed in the literature. The goal has been to specify the target conceptual domains in a manner that is consistent with prior research. In particular, the definitions offered here clearly build on previous work by Kahn, and Kahn and Mentzer.

In a 1996 article, Kahn provided an influential synthesis of the early literature on cross-functional communication and collaboration:

Some literature has characterized interdepartmental integration as interaction or communication-related activities, whereas other literature has associated interdepartmental integration with collaboration...There is also a third group of literature, which has implied a multidimensional characterization of integration. This latter perspective conceives interdepartmental integration as subsuming both interaction and collaboration processes.¹⁶

Building on this later view, Kahn and Mentzer proposed a formal definition of integration as “a process of interdepartmental interaction and interdepartmental collaboration that brings departments together into a cohesive organization.”¹⁷ A number of subsequent supply chain management scholars have used this conceptualization as their theoretical basis.

Interaction refers to the set of structured activities between functions that regulate the flow of information between these functions. Kahn operationalized the concept through survey items that ask whether respondents “interact” with other functional areas via meetings, committees, exchange of reports, and so on.¹⁸ Interaction in this sense represents a broad definition of communication that does not specify the content of what is communicated, whether the intention

of the sender is considered, or whether the evaluation of the communication by the receiver is considered.

As argued earlier, a more restrictive definition that specifies the transference of operationally relevant knowledge so that mutual understanding is achieved more appropriately captures the underlying concept of cross-functional communication. Indeed, although Kahn operationalizes interaction/communication in broad terms, the author's discussion of the concept suggests a more restrictive understanding:

Whereas communication should be considered a key component of interdepartmental relationships, viewing integration as 'interaction' prescribes that more meetings and greater information flows should be used to improved product development success. A concern is that more meetings and information flows are not necessarily the answer to improved product development success.¹⁹

The concern expressed in the preceding passage mirrors the point made by other authors that the central aspect of cross-functional communication is not the exchange of information *per se*, but rather the exchange of operationally relevant functional knowledge. Thus, the definition of cross-functional communication offered in this chapter seeks to build on the concept of interaction established by Kahn but adds specificity in a manner that is consistent with the original conceptualization and the broader literature on integration.

Likewise, our definition of cross-functional collaboration draws on the literature to add specificity to the conceptualization offered by Kahn and Mentzer. Kahn and Mentzer, for example, defined and operationalized collaboration as follows:

[Collaboration is] an affective and volitional process where departments work together with mutual understanding, common vision, and shared resources to achieve collective goals.

During the past three months, to what degree did your department pursue the following activities with other departments? (Never, Seldom, Occasionally, Often, Quite Frequently)

- Achieve goals collectively
- Have a mutual understanding
- Informally work together
- Share ideas, information, and/or resources
- Share the same vision for the company
- Work together as a team²⁰

First, the definition offered here clearly distinguishes collaboration from the more general concept of *cooperation*. This distinction indicates that collaboration goes beyond *achieving* goals collectively (cooperation) to include *defining* goals collectively. Second, “maintaining mutual agreement on priorities in reference to achieving those goals” more clearly specifies the conceptual content of having a “mutual understanding” and “common vision.” Third, this notion provides a context for understanding how and why information, ideas, and/or resources might be shared through a collaborative process by focusing attention on the constraints faced by participants. Refining the definition of cross-functional collaboration in these ways is to expect to have implications for its operationalization.

Finally, the definition of integration offered in this chapter adds the dimension of cross-functional coordination to the communication and collaboration elements identified by Kahn. The notion that integration entails the coordination of activities across functions has deep conceptual roots in the supply chain literature. Incorporating this dimension therefore adds an important element to the overall conceptualization of integration.

Planting the Seeds for Integration

It's clear from our interactions with managers and executives that integration is a positive state of being. In managerial practice, programs such as sales and operations planning (S&OP) have been implemented at hundreds of companies in an effort to achieve this integration, yet many of those companies would not describe themselves as truly integrated. The question remains, under what conditions can a company achieve this worthy goal, especially in a complex, potentially global enterprise? We propose that three conditions exist that provide the best environment for business integration to flourish: organizational structure, process, and culture. To illustrate our examples, we use S&OP as the specific context for presenting our ideas about the ideal conditions for fostering organizational integration. However, we would expect the same conditions to exist in many other integration-related settings as well.

Organizational Structure

By organizational structure, we refer to the reporting relationships that exist in a firm. In the internal supply chain of a company, organizational structure can encourage integration if a process is organizationally aligned with other functions of the enterprise. The most valuable integration opportunities tend to come when a function that is “upstream facing” integrates with others that are “downstream facing,” that is, when operations or logistics integrate with sales or marketing. However, these types of integration often present the biggest challenges. Such is the case of S&OP, which is often perceived, at least by sales and marketing people, as “supply chain planning” when it should be perceived as integrated *business* planning. By organizationally aligning the S&OP process with sales or marketing, such misperception can be addressed. Similar considerations can be made in the case of the organizational “home” of the forecasting, or demand

planning, function in a firm. Many firms house demand planning in the supply chain group, for reasons such as “we don’t trust sales and marketing to prepare accurate forecasts.” Organizationally aligning demand planning in the sales or marketing group, where demand actually occurs, can potentially contribute to integration.

One way that companies often use organizational structure in an attempt to drive integration is through a matrix organizational structure. For example, an S&OP process owner could find him or herself in a matrixed role, reporting to both a sales leader and a supply chain leader simultaneously. Or, in a variation on that theme, that individual could be “solid line” to the sales leader and “dotted line” to a supply chain leader. Although simple to execute, such a strategy often creates the illusion of integration, rather than true integration. Although such matrix approaches can encourage individuals to be cognizant of the needs of multiple functions, it can also lead to significant role conflict or role ambiguity in the individuals involved. Without attention to the other two drivers of integration— integrative processes and a culture that facilitates integration—such organizational structure strategies are unlikely to lead to true integration.

Process

Processes are formal, disciplined mechanisms that bring together relevant pieces of information, from different points of view, delivered by different people, in a regularly scheduled forum, to help the organization make decisions that will help it achieve its goals. Such processes are referred to as S&OP, SIOP, IBP, DSI, or other labels. A good example is the well-documented integrated business planning process that is normally associated with the consulting firm Oliver Wight. From a high-level view, it typically consists of five separate steps: Product and Portfolio Planning, Demand Planning, Supply Planning, Financial Reconciliation, and Executive Review. Each step is often documented with detailed flowcharts that describe the

sequence of events that must occur, the analyses that need to be completed, and the timing of those analyses. Such a process is often repeated on a regular, monthly drumbeat. Information is brought together from multiple functions in the firm, including sales, marketing, supply chain, finance, and senior management. Customers and suppliers are often represented in the different stages of the process. Companies frequently spend large amounts of time and effort to construct and document these processes, and they are often elegantly designed and comprehensive. Unfortunately, it is our contention that these processes, by themselves, often fail to achieve true integration. Both organizational structure and integrative processes are necessary but not sufficient to the goal of true integration. The final mechanism, culture, must be addressed.

Culture

Defining culture is difficult. John Mello has published articles in this and other outlets in which he has commented upon the effect that culture has on effective forecasting and business integration.²¹ Merriam-Webster defines culture as “a way of thinking, behaving, or working that exists in a place or organization (such as a business).” An organization’s culture can be observed in the norms of behavior and attitude that are present in a firm. How people think; how they interact with others; what they find important; how hard they work; how they dress—all these and countless others define an organization’s culture.

Some organizational cultures are supportive of integration, and some are resistant. Those that are resistant to integration are characterized by each functional group having its own unique culture, and the people are distrustful, or even disdainful, of other functional groups’ cultures. In a business integration context, this can be manifested in the following types of statements:

“I don’t believe any of the forecasts coming out of sales. They’re way too optimistic.”

“All the supply chain people care about is minimizing inventory. They don’t care about serving our customers.”

“Finance is living in dreamland. We’ll never make that Annual Operating Plan number.”

On the other hand, a culture that promotes integration is one where people are pursuing common goals, regardless of the functional area in which they work. So what can a company do to create that integration-friendly culture? Or, what can a company do to transform an integration-*unfriendly* culture into one where integration can thrive? It is our assertion that there are two approaches to addressing these problems, *both of which must be addressed*: top-down and bottom-up.

Tools Available to Managers

Top-Down Culture Change

The signals that people receive from those who are above them in an organization influence their behaviors and their attitudes. This means that enterprise leaders must send very clear, consistent signals that integration is a business imperative and that everyone must behave in this way. In any enterprise, the C-suite executives—CEO, Chief Demand Officer (whether that be the head of sales, the head of marketing, or both), Chief Supply Officer (which might be a combination of head of supply chain and head of manufacturing), and the CFO—must say, and more importantly do, everything possible to communicate that integrative behavior is expected.

The most important piece of top-down culture change is *what senior leaders do*, not *what senior leaders say* (although what they say is important, too). They have to be willing to expend resources to get the right tools and people in place to support the integrative business processes. They have to be willing to look at measurement and incentive systems that are in place, to be sure that integrative behaviors are in fact rewarded. And they have to model those behaviors; they have to regularly attend and engage in the executive S&OP meetings and show willingness to sometimes sacrifice their own functional objectives to reach common objectives.

Importantly, the one individual that *must* play this leadership role is the Chief Demand Officer. Consistent with our previous comments, one of the most common causes of S&OP failure is lack of engagement from the demand side of the enterprise—sales, marketing, or both. Several companies have described their S&OP processes as being “&OP—sales is nowhere to be found.” The Chief Supply Officer is usually the driver of these integrative processes, so he or she is usually a believer. So the greatest challenge to creating this top-down culture change is to convince both the CEO and the Chief Demand Officer that these integrative processes must be put in place and supported with committed behaviors from those involved.

Bottom-Up Culture Change

Although the impetus for the culture change needed to achieve true business integration must start at the top of the organization, integration is unlikely to occur just because the CEO wants it to happen. So what can be done to drive these integrative behaviors on the part of the people actually doing the work? Focus should be placed in two areas: incentive and measurement strategies and education and training.

A useful piece of folk wisdom can be found in the phrase “what gets measured gets rewarded, and what gets rewarded gets done.”

In this context, this folk wisdom suggests that if you want individuals to engage in integrative behaviors, encourage such behaviors through their compensation structures or their performance plans. For example, most organizations benefit from receiving demand-forecasting input from their sales teams. This would be an example of a valuable integrative behavior. However, in many companies this behavior is neither measured nor rewarded. Without measuring this contribution, and acknowledging that contribution in either the compensation structure or individual performance plans, it is not surprising if salespeople either spend very little time on the task, or even worse, if they intentionally provide *bad* information in order to advance a different agenda. Thus, the measurement and reward strategy can incentivize integrative behaviors. So bottom-up cultural change can be initiated and reinforced by closely examining the way all people are measured and rewarded. Senior leaders need to look carefully at what drives individual decision making, and finding ways to measure and reward integrative action must be a priority.

The second way that culture change can take place is through education and training. The training that is most impactful for driving organizational change is when individuals from multiple functional silos sit in a classroom together to learn about the benefits of integration, and how they can individually contribute to that integration. Many times, “aha” moments take place when individuals from sales first hear what happens to the forecasts that they submit. “I had no idea that my forecast had that impact,” they say. “I thought I was just gaming my future quota numbers. You mean you actually take that forecast and make supply chain decisions based on those numbers? Are you kidding me?” Extremely useful classroom experiences can occur when people from sales, marketing, logistics, procurement, operations, finance, and demand planning are all in the same training class. One useful mechanism is to run a simulation and assign salespeople to logistics roles, or procurement people to marketing roles, or finance people to sales roles. Real moments of insight occur when

people experience the effects that their nonintegrative behaviors have on the company.

Clearly, bottom-up culture change must be planned and managed. It doesn't happen on its own.

Conclusion

In summary, then, important points to remember from this chapter are the following:

- S&OP, or other similarly named processes, often fail to achieve true integration.
- Integration should be thought of as multiple entities *behaving as if they were a single entity* to achieve *common organizational goals*.
- Integration can be achieved through multiple mechanisms: organizational structure, integrative processes, and organizational culture. Culture is, by far, the most important, yet the most difficult, to put into effect.
- Efforts to achieve true business integration must be driven both from the top down and from the bottom up. Top-down change is driven by senior leadership commitment to an organizational structure that will not impede integration, formal disciplined processes that create a forum for integration, and a culture that will facilitate integration. Bottom-up efforts to achieve integration should be driven by measurement and reward structures that incentivize integrative behaviors, and education and training opportunities that demonstrate to individual people the benefits that can derive from true business integration.

Endnotes

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Index

Numbers

3TG, 187

A

aberrations, DSI (demand and supply integration), 160-163
 plan-driven forecasting, 161
Accenture, 219-220
accountability, 74
 DSI (demand and supply integration), 173
 ownership, returns management, 197
accounting, returns management, 183
Action Appliance, 179
action plans, IBCPS (interest-based collaborative problem solving), 43-44
active listening, 39
affinity exercise, 43
aha moments, 23
aligning
 operational execution with value
 focus, DSI (demand and supply integration), 74
 PLi, surveys, 106
alignment, 191
 lack of alignment, DSI (demand and supply integration) aberrations, 163
 market and nonmarket strategies, Walmart, 140-141
 returns management, 193-198
alignment framework, 126-130
 company analysis, 128, 135-136
 competitor analysis, 128, 134
 country analysis, 128, 134-135
 industry analysis, 128, 130
 buyer power, 131-132
 competitive rivalry, 130-131
 new entrants, 133
 substitutes, 132-133
 supplier power, 132
 market strategy alignment, 128
 nonmarket strategy, 128
 stakeholder analysis, 128, 135

alignment of purchasing and logistics, 120
Amazon Prime Day, 270
 market turbulence, 282
apparel industry, demand and supply integration (DSI), 147-148
Apple
 barriers to integration, 304
 Songs of Innocence (U2), 283
approved provider transaction model, sourcing continuum, 213-215
Approved Supplier List (ASL), 216
Arrow Electronics, 251
asking back, 39
ASL (Approved Supplier List), 216
ATMI Inc., 251
automotive assembly, DSI (demand and supply integration), 55-57
automotive industry
 resource scarcity, 239
 Toyota, relational barriers, 306
autonomy, marketing strategy innovation, 276-277, 290

B

BAAS (business as a service), 87
balanced scorecards, 63
barriers to integration, 85-88, 302
 external barriers to integration, 297-300
 information barriers, 302-304
 overcoming, 309-311
 overview, 311-312
 process barriers, 304-306
 relational barriers, 306-308
 summary of, 308-309
basic provider model, sourcing continuum, 212-213
behavioral antecedents, 7
behaviors, 7
Bell Canada, 222-223
best practices
 best-in-class organizations, 91-92
 PLi, 107-108
 effective systems and processes that enable superior results, 116-118

fully integrated end-to-end supply chain organization with common metrics, 108-112
networks with operating decision frameworks based on TVO, 114-116
talented supply chain organizations that reward leadership, 112-114
 best-in-class organizations, best practices, 91-92
 best-in-class supply chains, 111
 book publishing industry
 returns management, 192-193
 total cost analysis, 194-195
 bottom-up culture change, 22-24
 BPI (business process integration), 83
 BPS (business process standardization), 83
 April 2010 oil spill, 138
 Bridgestone, 143
 building, inventory, 154
 business as a service (BAAS), 87
 business model map, 229
 business plans, DSI (demand and supply integration), 156
 business process integration (BPI), 83
 business process standardization (BPS), 83
 business scorecards, 119
 business success, aligning (PLi), 106
 buy or outsource, 207-208
 buyer power, industry analysis, 131-132

C

capacity, increasing, 154
 capacity and demand balance, DSI (demand and supply integration), 71
 capacity forecast, 153
 supply review, 169
 capitalism, 208
 Center for Information Systems Research (MIT), 83
 centralized distribution, 86
 CEP (corporate environmental performance), 142
 CFI (cross functional integration). *See* cross functional integration, 7-9
 CFP (corporate financial performance), 142
 challenging work, marketing strategy innovation, 277-278, 290-291
 change
 bottom-up culture change, 22-24
 top-down culture change, 21-22
 characteristics of successful implementation, DSI (demand and supply integration), 172-175
 Chick, Gerard, 204
 China, rare earth metals, 240
 climate change, 260
 cloud, 87
 Coca-Cola, 134
 knowledge of marketing environments, 281
 market turbulence, 281
 Share A Coke, 268
 water supply, 240
 cocoa, scarcity, 241
 Coleman, John, 234
 collaboration, 9, 16-17, 204
 cross-functional collaboration, 10-12
 DSI (demand and supply integration), 164-165
 collaborative communication, training, 41
 Collaborative Planning, Forecasting, and Replenishment (CPFR), 159
 Comcast, 140
 commoditization, 209
 communication
 cross-functional communication, 13-14
 IBCPS (interest-based collaborative problem solving)
 focusing, 40-41
 listening, 39
 questioning, 38-39
 sharing functional information, 41-42
 thinking, 40
 training in collaborative communications, 41
 PLi, surveys, 104-106
 communication processes, IBCPS (interest-based collaborative problem solving), 38-42
 communicative supply chain relationships, 310
 company analysis, alignment framework, 128, 135-136
 competition
 outsourcing, 209
 for raw materials, 261
 competitive rivalry, industry analysis, alignment framework, 130-131
 competitor analysis, alignment framework, 128, 134
 components of
 DSI (demand and supply integration), 166-167
 demand review, 168
 executive DSI review, 171-172
 portfolio and product review, 167-168
 reconciliation review, 170-171
 supply review, 169-170
 conceptualizing, integration, 300-302
 conflict, overcoming, within integration, 32-35
 conflict minerals, 187
 Conflict Minerals legislation, 243
 constructive communication
 IBCPS (interest-based collaborative problem solving), 38-42
 focusing, 40-41
 listening, 39

- questioning*, 38-39
 - sharing functional information*, 41-42
 - thinking*, 40
 - training in collaborative communications*, 41
 - consumer electronics manufacturing
 - capacity and demand balance, 71
 - DSI (demand and supply integration), 64-67
 - integrated behaviors, 70
 - integrated knowledge sharing, 69
 - performance, 72
 - resource allocation, 69-70
 - value focus, 68
 - consumer goods manufacturing, fast-moving consumer goods manufacturing, DSI (demand and supply integration), 61-64
 - consumer packaged goods firms, 47
 - consumption of raw materials, 261
 - continuity
 - GE aircraft manufacturing, 250-251
 - integration, 248-249
 - Mitsubishi Electronics Corporation, 251
 - Cook, Tim, 283
 - cooperation, 11
 - cooperative interdependence, 34
 - coordination, 9
 - cross-functional coordination, 12-13
 - operating models, 83
 - core competencies, 206
 - core principles, DSI (demand and supply integration), 164-166
 - corporate environmental performance (CEP), 142
 - corporate financial performance (CFP), 142
 - corporate hierarchies, 205-207
 - corporate social/environmental performance (CSP), 142
 - cost focus, automotive assembly, DSI (demand and supply integration), 57
 - country analysis, alignment framework, 128, 134-135
 - CPFR (Collaborative Planning, Forecasting, and Replenishment), 159
 - creativity, innovation, 268
 - cross functional integration, 5-12
 - cross-functional collaboration, 10-12
 - cross-functional communication, 13-14
 - cross-functional collaboration, 10-12
 - cross-functional communication, 13-14
 - cross-functional coordination, 12-13
 - cross-functional integration, 190-193
 - CSP (corporate social/environmental performance), 142
 - cultural barriers, 86
 - cultural differences, relational barriers, 308
 - culture, 20-21
 - bottom-up culture change, 22-24
 - top-down culture change, 21-22
 - customer relationships, returns management, 199
 - customer service, returns management, 182
- ## D
- Dach, Leslie, 140
 - dampen demand, 154
 - DCM (Demand Chain Management), 50
 - Deaver, Michael, 140
 - decision makers, providing action plans to, 44
 - decision making, DSI (demand and supply integration), 73
 - decision rules, 37
 - Dell, vested sourcing business model, 233-234
 - Dell Computer, barriers to integration, 303
 - demand, dampening, 154
 - demand and supply integration (DSI). *See* DSI (demand and supply integration), 49, 147-148
 - aberrations, 160-163
 - lack of alignment*, 163
 - plan-driven forecasting*, 161
 - tactical processes*, 161-162
 - accountability, 173
 - across supply chains, 157-159
 - business plans, 156
 - characteristics of successful implementation, 172-175
 - collaboration, 164-165
 - components of, 166-167
 - demand review*, 168
 - executive DSI review*, 171-172
 - portfolio and product review*, 167-168
 - reconciliation review*, 170-171
 - supply review*, 169-170
 - core principles, 164-166
 - discipline, 165-166
 - failure, 172
 - financial plans, 157
 - ideal state, 152-157
 - leadership, 173
 - operational plans, 157
 - overview, 148-149
 - versus S&OP, 149-150
 - signs that demand and supply are not integrated effectively, 151-152
 - sweet spots, 166
 - demand balance, DSI (demand and supply integration), managerial implications, 71
 - Demand Chain Management (DCM), 50
 - demand creation activities, 108
 - demand driven, DSI (demand and supply integration), 164
 - demand forecast, 153
 - demand fulfillment activities, 108
 - demand generation activities, 48
 - demand planning, 19

demand review, DSI (demand and supply integration), 168

demand side disconnects, 94

Deming, W. Edwards, 93

Democratic Republic of the Congo (DRC), 187

Desired Outcomes, 220, 230

detection, managing network of risk, 244-245

difficulties with, integration, 30-31

discipline, DSI (demand and supply integration), 165-166

disruptions

- managing, 253-259
- recovery, 246
- supply risk, 242-243
- upstream disruptions, 244

distributive justice, 306

diversification, operating models, 83

Dodd-Frank Bill, 187

downstream facing integration, 19

Drucker, Peter, 48, 191, 203, 305

- barriers to integration, 309

DSI (demand and supply integration), 49-52

- aberrations, 160-163
 - lack of alignment*, 163
 - plan-driven forecasting*, 161
 - tactical processes*, 161-162
- accountability, 173
- across supply chains, 157-159
- aligning operational execution with value focus, 74
- apparel industry, 147-148
- business plans, 156
- characteristics of successful implementation, 172-175
- collaboration, 164-165
- components of, 166-167
 - demand review*, 168
 - executive DSI review*, 171-172
 - portfolio and product review*, 167-168
 - reconciliation review*, 170-171
 - supply review*, 169-170
- core principles, 164-166
- decision making, 73
- demand driven, 164
- discipline, 165-166
- examples of, 53
 - automotive assembly*, 55-57
 - consumer electronics manufacturing*, 64-67
 - fast-moving consumer goods manufacturing*, 61-64
 - health and beauty care manufacturing*, 58-61
- failure, 172
- financial measure of performance, 53
- financial plans, 157
- ideal state, 152-157
- information visibility, 73
- leadership, 72-73, 173

- managerial implications, 68
 - capacity and demand balance*, 71
 - integrated behaviors*, 70
 - integrated knowledge sharing*, 69
 - performance*, 72
 - resource allocation*, 69-70
 - value focus*, 68
- operational plans, 157
- overview, 148-149
- prioritizing, 73-74
- research, 75-77
- versus S&OP, 149-150
- shared knowledge, 73
- signs that demand and supply are not integrated effectively, 151-152
- sweet spots, 166
 - as a tactical process, 161-162

DSI Maturity Matrix, 52

DuPont, marketing strategy

- innovation, 291

dynamic global supply network and, resource scarcity and, 260-263

E

Early Responsibility program, Procter & Gamble, 290

Edelman, 141

empowerment, 74

- teams, PLI, 116-118

encouragement, 33

end-to-end supply chains, 119

entrants, industry analysis, 133

environmental concerns, reverse supply chain, 186

environmental regulations, water supply, 260

environmental scanning, marketing strategy innovation, 291-292

environmental strategy, 138

- Walmart, 141

equal status, interfunctional bias, 33

Equity Partnerships, 223-225

examples of

- continuity and resiliency
 - GE aircraft manufacturing*, 250-251
 - Mitsubishi Electronics Corporation*, 251
- DSI (demand and supply integration), 53
 - automotive assembly*, 55-57
 - consumer electronics manufacturing*, 64-67
 - fast-moving consumer goods manufacturing*, 61-64
 - health and beauty care manufacturing*, 58-61
- Equity Partnerships, 224-225
- sourcing business models
 - approved provider transaction model*, 214-215
 - basic provider model*, 212-213

performance-based/managed services model, 218-219
shared services model, 222-223
vested sourcing business model, 220-221

sourcing continuum, 216-217
 executive DSI review, 171-172
 exit management, 232
 external barriers to integration, 297-300
 external firm conditions, marketing strategy innovation, 271-273
 external requirements, vested sourcing business model, 233-234

F

factors that lead to integration, 6-7
 failure, of DSI, 172
 fast-moving consumer goods manufacturing
 capacity and demand balance, 71
 DSI (demand and supply integration), 61-64
 integrated behaviors, 70
 integrated knowledge sharing, 69
 performance, 72
 resource allocation, 69-70
 value focus, 68
 feedback for employees, 290
 FIJI, 139
 finance, partnering with, 120
 finances, prioritizing, DSI (demand and supply integration), 73-74
 financial flow, 184, 199
 financial measure of performance, DSI (demand and supply integration), 53
 financial plans, DSI (demand and supply integration), 157
 Firestone, 143
 firm conditions, marketing strategy innovation, 271-273
 firm performance, 124
 firms, high-performance firms, 284
 Fisher, Marshall, 48
 fisheries, 263
 fishing industry, 263
 Five Rules, vested sourcing business model, 227-228
 clearly defined and measurable outcomes, 230
 focus on outcomes, 229
 focus on the what, not the how, 229-230
 insight versus oversight governance structure, 231-234
 pricing model incentives, 231
 flexibility, 67
 flows concept, 184
 synchronization, returns management, 198-200
 focusing, IBCPS (interest-based collaborative problem solving), 40-41

forecast accuracy, consumer electronics manufacturing, 66
 forward flow, 183-185
 fostering, purchasing and logistics integration, 104
 Friedman, Thomas, 203
 functional diversification, 10
 functional information, sharing, 41-42
 functional integration, 90-91
 functional interests, identifying, 43
 functional specialization, 299

G

game theory, 209
 gatekeeping, 181
 GE aircraft manufacturing, continuity and resiliency, 250-251
 GENCO, vested sourcing business model, 233-234
 General Motors, barriers to integration, 304
 governance structure, vested sourcing business model, 231-234
 Great Divide, 48-49
 Greenfield, Ben, 136
 grocery stores, market strategy, 137
 ground rules, IBCPS (interest-based collaborative problem solving), 36-37
 group behavior, 30
 groups, 30-31

H

Hamel, Gary, 206
 Handfield, Dr. Robert, 204
 Haslam College of Business, Global Supply Chain Institute, 89
 health and beauty care manufacturing, DSI (demand and supply integration), 58-61
 high-performance firms, 284
 ideal profiles, 284-286
 Hirai, Kazuo, 225
 Honda Motor Company, 187
 HubSpot, 280
 human resources, prioritizing, in DSI, 73-74
 hybrid relationships, sourcing continuum, 208-210

I

IBCPS (interest-based collaborative problem solving), 30, 35
 action plans, 44
 considering potential actions and selecting action plans, 43-44
 constructive communication process, 38-42

- defining problems/situations to overcome/outcomes to be achieved, 42
- establishing ground rules/conduct initial sharing/determine logistics, 36-37
- identifying individual and functional interests, 43
- providing action plans to decision makers, 44
- IBP (integrated business planning), 96**
- ideal profiles, 284-286
- ideal state, **DSI (demand and supply integration), 152-157**
- identifying
 - individual and functional interests, 43
 - roadblocks, IT infrastructure integration, 86-87
- identity, subordinate identity, 32-35
- implications, marketing strategy innovation, 286-289
- increasing capacity, 154
- independent partners, 311
- individual interests, identifying, 43
- industry analysis, alignment framework, 128, 130
 - buyer power, 131-132
 - competitive rivalry, 130-131
 - new entrants, 133
 - substitutes, 132-133
 - supplier power, 132
- inequality, 33
- information barriers, 302-304
 - structural barriers, 303
- information channels, 301
- information exchange, 9
- information flow, 184
- information sharing, barriers to integration, 302-304
- information visibility, **DSI (demand and supply integration), 73**
- informational-structural barriers, 303
- information-social barriers, 304
- in-groups, 30
- innovation, 204, 210
 - creativity, 268
 - marketing strategy innovation. *See* marketing strategy innovation
- integrated behaviors, **DSI (demand and supply integration)**
 - consumer electronics manufacturing, 67
 - managerial implications, 70
- integrated business planning (IBP), 96
- Integrated Business Planning process, 19
- integrated global supply chain, 109
- integrated knowledge sharing, **DSI (demand and supply integration), 69**
- integrated supply chains, 119
- Integrating Marketing Strategy with a Firm's Internal and External Conditions, 273
 - implications, 286-289
 - interviews, 275
 - recommendations, 289-293
- results of, 276
 - effect of autonomy, 276-277*
 - effect of challenging work, 277-278*
 - knowledge of marketing environments, 279-281*
 - market turbulence, 281-283*
 - overall organizational integration, 283-286*
- surveys, 273-275
- integration**
 - conceptualizing, 300-302
 - continuity and resiliency, 248-249
 - cross functional integration, 5, 9-10
 - cross-functional integration, 190-193
 - culture, 20-21
 - difficulties with, 30-31
 - factors that lead to integration, 6-7
 - functional information, 90-91
 - internal integration. *See* internal integration
 - performance, 7-8
 - processes, 19-20
 - purchasing and logistics integration, 93-94
 - results of, 94
 - supply chain management and, 4-6
 - understanding, 8-9
- integration levels, versus network risk, 257
- Intel, approved provider transaction model, 215
- interaction, 16
 - interpersonal interaction, 34
- interdepartmental integration, 15
- interdependence, 34
- interest-based collaborative problem solving. *See* IBCPS (interest-based collaborative problem solving)
- interests, identifying, 43
- interfunctional bias, 31-32
 - equal status, 33
 - overcoming conflict, 32-35
- internal conditions, marketing strategy innovation, 287-289
- internal firm conditions, marketing strategy innovation, 271-273
- internal integration, 177
 - returns management, 178
 - managerial actions, 200-201*
 - micro approach, 178-181*
 - returns management process, 181-183*
 - reverse flows, 183-190*
- interpersonal interaction, 34
- interviews, marketing strategy innovation, 275
- inventory, building, 154
- IT infrastructure integration, 80
 - cloud, 87
 - identifying, roadblocks, 86-87
 - optimizing, 87-88
 - supply chain effectiveness, 80-82
- iTunes, Songs of Innocence (U2), 283

J

- Japanese earthquake and tsunami 2011 disruptions, 244
- Japanese earthquake and tsunami 2011 Mitsubishi Electronics Corporation, 251-252
- joint business planning, 63
- Jones Lang LaSalle, 220-221

K

- knowledge of marketing environments, marketing strategy innovation, 279-281

L

- lack of alignment, DSI (demand and supply integration) aberrations, 163
- LCD panels, 224-225
- leadership
 - actions for leaders, PLI, 118-120
 - DSI (demand and supply integration), 72-73, 173
 - PLI, best practices, 112-114
 - strategic management, 125-127
- legal, returns management, 182
- levels of risk, 257
- listening, IBCPS (interest-based collaborative problem solving), 39
- logistics, 91
 - gaps with purchasing, 96-98
 - performance relative to expectations, surveys, 99-105
 - returns management, 183
 - surveys, 100
- logistics capabilities, 170

M

- macro environmental factors, 292
- make versus buy, 205-207
- managed services model, 217-219
- managerial actions, returns management, 200-201
- managerial implications, DSI (demand and supply integration), 68
 - capacity and demand balance, 71
 - integrated behaviors, 70
 - integrated knowledge sharing, 69
 - performance outcomes, 72
 - resource allocation, 69-70
 - value focus, 68
- managers
 - bottom-up culture change, 22-24
 - marketing strategy innovation, 270
 - strategic alignment, 92
 - top-down culture change, 21-22

managing

- risk, 243-244
 - detection*, 244-245
 - mitigation*, 246
 - recovery*, 246-247
- supply disruptions, 253-259
- supply risk, 253
- manufacturing capabilities, 169
- mapping efforts, 253-254
- market conditions, 293
- market mode, 207-208
- market strategy, 137, 142-143
- market strategy alignment, 128
- market turbulence, marketing strategy innovation, 281-283
- marketing, returns management, 182
- marketing environments, knowledge of, marketing strategy innovation, 279-281
- marketing flows, 184
- marketing focus, health and beauty care manufacturing, DSI (demand and supply integration), 58-60
- marketing strategy, 269
- marketing strategy innovation
 - Amazon Prime Day, 270
 - challenging work, 290-291
 - Coca-Cola, 268
 - environmental strategy, 291-292
 - firm conditions, 271-273
 - implications, 286-289
 - interviews, 275
 - managers, 270
 - market conditions, 293
 - Procter & Gamble, 269
 - recommendations, 289-293
 - results of, 276
 - effect of autonomy*, 276-277
 - effect of challenging work*, 277-278
 - knowledge of marketing environments*, 279-281
 - market turbulence*, 281-283
 - overall organizational integration*, 283-286
 - surveys, 273-275
- markets, sourcing continuum, 207-208
- Mello, John, 20
- metals scarcity, 240
- Michelin, 143
- micro approach, returns management, 178-181
- micro environmental factors, 292
- Microsoft Preferred Supplier Program (MPSP), 216
 - agreement with Accenture, 219-220
- mining industry, 240
- mitigation, 246
- models
 - operating models, 83-85
 - sourcing business models, 210-211
 - approved provider transaction model*, 213-215
 - basic provider model*, 212-213
 - Equity Partnerships*, 223-224

performance-based/managed services model, 217-219
preferred provider model, 215-217
shared services model, 221-223
vested sourcing business model, 219-221
 transactional business model, 210
 Mondelez International, 241
 MPSP (Microsoft Preferred Supplier Program), 216
 multi-discipline supply teams, 110-112, 119

N

natural disasters, managing disruptions, 244
 Japanese earthquake and tsunami 2011, continuity and resiliency, 251
 Nestle, resource scarcity, 259
 network of risks
 detection, 244-245
 managing, 243-244
 mitigation, 246
 recovery, 246-247
 supply chains, 242-243
 network risk, versus integration levels, 257
 networks
 dynamic global supply network and, resource scarcity, 260-263
 managing supply disruptions, 253-259
 new entrants, industry analysis, alignment framework, 133
 Nike, marketing strategy innovation, 288
 Nissan, resource scarcity, 239
 nonmarket stakeholder groups, 138
 nonmarket strategy, 124, 128, 138-140, 142-143
 Pepsi, 141-142
 Nooyi, Indra, 141

O

oil industry, 138
 Oliver Wight, 19, 94
 operating models, 83-85
 operational execution, aligning with value focus, 74
 operational plans, DSI (demand and supply integration), 157
 organizational integration, marketing strategy innovation, 283-286
 organizational structure, 18-19
 organizations, best-in-class organizations, best practices, 91-92
 outcomes to be achieved, defining, 42
 outgroup derogation, 32
 out-groups, 30

outsourcing, 203-204
 sourcing continuum, 204-205
 corporate hierarchies, 205-207
 hybrid relationships, 208-210
 using the market, 207-208
 overcoming
 barriers to integration, 309-311
 conflict, within integration, 32-35
 ownership, returns management, 196-197

P

partnering with, finance, 120
 partnerships, 311
 structured partnerships, 310
 Patagonia, 139
 Pepsi, 134
 nonmarket strategy, 141-142
 performance
 DSI (demand and supply integration), managerial implications, 72
 financial measure of performance, DSI (demand and supply integration), 53
 firm performance, 124
 integration, 7-8
 logistics, surveys, 99-105
 purchasing, surveys, 105
 performance management, vested relationships, 230
 performance-based services model, 217-219
 PEST (Political, Economic, Social cultural, and Technological), 134
 pharmaceutical firms, 47
 physical flow, 184
 pizza restaurants, market strategy, 137
 plan-driven forecasting, DSI (demand and supply integration) aberrations, 161
 PLi, 91
 actions for leaders, 118-120
 alignment to business success, surveys, 106
 best practices, 107-108
 effective systems and processes that enable superior results, 116-118
 fully integrated end-to-end supply chain organization with common metrics, 108-112
 networks with operating decision frameworks based on TVO, 114-116
 talented supply chain organizations that reward leadership, 112-114
 research, surveys, 98-101
 self-test, 120-121
 surveys
 alignment of purchasing and logistics, 102
 communication, 104-106

- interaction is informal and unstructured*, 103
procurement and logistics are disconnected, 101
- political action, reverse supply chain, 187
 political strategy, 124, 140
 popcorning, 39
 populations, raw material
 consumption, 261
 portfolios, DSI (demand and supply integration), 167-168
 Prahalad, C. K., 206
 preferred provider model, sourcing continuum, 215-217
 premium suppliers, 216
 pricing, competitive rivalry, 131
 pricing model incentives, 231
 prioritizing financial and human resource deployment, DSI (demand and supply integration), 73-74
 problems
 defining, 42
 with purchasing and logistics gaps, 96-98
 procedural justice, 306
 process barriers, 304-306
 process-social barriers, 305-306
 process integration, 84
 process ties, 301
 processes, 302
 communication processes, IBCPS (interest-based collaborative problem solving), 38-42
 Integrated Business Planning process, 19
 integration, 19-20
 PLi, best practices, 117-118
 returns management, 181-183
 process-social barriers, 305-306
 process-structural barriers, 305
 Procter & Gamble, 220-221
 challenging work, 290
 marketing strategy innovation, 269
 winning partnerships, 269
 procurement and logistics. *See* PLi
 procurement professionals, outsourcing, 209-210
 product proliferation, 60
 product review, DSI (demand and supply integration), 167-168
 products, recovering, 188-189
 profiles, ideal profiles, 284-286
 PSI (Progistix Solutions Inc.), 222-223
 purchase orders (POs), preferred provider model, 216
 purchasing
 gaps with logistics, 96-98
 performance relative to expectations, surveys, 105
 surveys, 100
 purchasing and logistics, gaps between, 96-98
 purchasing and logistics integration, 93-94
 fostering, 104
- Q**
 questioning, constructive communication, 38-39
- R**
 R&D, 119
 racial integration, 33
 racism, 31
 rare earth metals, 240
 GE aircraft manufacturing, 250-251
 rate cards, preferred provider model, 216
 raw materials, 259. *See also* resource scarcity
 competition for, 261
 consumption of, 261
 Raytheon, 218-219
 recaptured products, 186
 recommendations, marketing strategy innovation, 289-293
 reconciliation review, DSI (demand and supply integration), 170-171
 recovering products, 188-189
 recovery, 246-247
 refurbishment, returns management, 183
 regulations, reverse supply chain, 187
 relational barriers, 306-308
 relational “glue,” 301
 relationship management, vested sourcing business model, 232
 relationships
 communicative supply chain relationships, 310
 hybrid relationships, sourcing continuum, 208-210
 vested relationships, 226-228
 reloading, 39
 remanufacturing, returns management, 183
 renewable resources, 263
 resource scarcity, 241
 replication, operating models, 83
 research
 DSI (demand and supply integration), 75-77
 PLi, surveys, 98-101
 resiliency
 GE aircraft manufacturing, 250-251
 integration, 248-249
 Mitsubishi Electronics Corporation, 251
 resource allocation, DSI (demand and supply integration), managerial implications, 69-70
 resource scarcity, 239-241
 dynamic global supply network and, 260-263
 GE aircraft manufacturing, 250-251
 integration, continuity and resiliency, 248-249
 supply risk, 241-243
 water supply, 240

responsiveness, supply chain effectiveness, 81-82

results of

- ideal profiles, 284-286
- integration, 94
- marketing strategy innovation, 276
 - effect of autonomy*, 276-277
 - effect of challenging work*, 277-278
 - knowledge of marketing environments*, 279-281
 - market turbulence*, 281-283
 - overall organizational integration*, 283-286

returns management, 178, 183-184

- book publishing industry, 192-193
- challenges of, 190
 - alignment*, 193-198
 - cross-functional integration*, 191-193
 - synchronizing flows*, 198-200
- customer relationships, 199
- forward flow, 185
- managerial actions, 200-201
- micro approach, 178-181
- ownership of process, 196-197
- returns management process, 181-183
- reverse flows, 183-190
- total cost analysis, 194-195

reverse flows, 183-190

Reverse Logistics Association, 183

reverse supply chain, 183-190

rewarding, culture change, 23

Riedel, Joseph A., 288

risk

- managing, 243-244, 253
 - recovery*, 246-247
- supply chain management, 241-242
- supply risk
 - detection*, 244-245
 - mitigation*, 246
 - network of risks*, 242-243

risk levels, 257

rivalry, industry analysis, alignment framework, 130-131

roadblocks, identifying, in IT infrastructure, 86-87

rules, IBCPS (interest-based collaborative problem solving), 36-37

rules for vested sourcing business model, 227-228

- clearly defined and measurable outcomes, 230
- focus on outcomes, 229
- focus on the what, not the how, 229-230
- insight versus oversight governance structure, 231-234
- pricing model incentives, 231

S

S&OP (Sales and Operations Planning), 18

- culture, 20-21
- versus DSI, 149-150
- organizational structure, 18-19
- processes, 19-20

sales, returns management, 182

sales, inventory and operations planning (SIOP), 96

Sales and Operations Planning. *See* S&OP

Samsung

- barriers to integration, 304
- Equity Partnerships, 224-225

Sarbanes-Oxley (SOX), 195

scarce resources. *See* resource scarcity

scorecards, 119

- balanced scorecards, 63

Scott, H. Lee, 140-141

SDP (Supplier Development Program), 214

self-test, PLI, 120-121

sell more, 181

Sell Right, Not MORE, 179

selling more, 180

selling right, 180

service-level agreement (SLA), 220

Share A Coke, 268, 281

shared knowledge, DSI (demand and supply integration), 73

shared services model, 221-223

shared vision, 229

sharing functional information, 41-42

signs that demand and supply are not integrated effectively, 151-152

SIOP (sales, inventory, and operations planning), 96

SLA (service-level agreement), 220

Smith, Adam, 2, 208

social barriers

- information barriers, 304
- process barriers, 305-306
- relational barriers, 307

social strategy, 139

soft skills, 7

Software Advice, 303

Songs of Innocence (U2), 283

Sony, Equity Partnerships, 224-225

SOO (Statement of Objectives), 230

sourcing business models, 210-211

- approved provider transaction model, 213-215
- basic provider model, 212-213
- Equity Partnerships, 223-224
- performance-based/managed services model, 217-219
- preferred provider model, 215-217
- shared services model, 221-223
- vested sourcing business model, 219-221

sourcing continuum, 204-205, 211

- corporate hierarchies, 205-207
- hybrid relationships, 208-210
- using the market, 207-208

- SOX (Sarbanes-Oxley), 195
- special concerns, vested sourcing business model, 233-234
- specialization, 3
- specialized investments, 208
- SSO (shared service organization), 221-223
- stakeholder analysis, alignment framework, 128, 135
- stakeholders, nonmarket strategy, 138
- Statement of Intent, 229
- Statement of Objectives (SOO), 230
- strategic alignment, 90
managers, 92
- strategic direction, 74
- strategic management, 125-127
alignment framework, 127-128
company analysis, 128
competitor analysis, 128
country analysis, 128
industry analysis, 128
market strategy alignment, 128
nonmarket strategy, 128
stakeholder analysis, 128
- strategy
environmental strategy, 138
nonmarket strategy, 124
political strategy, 124, 140
social strategy, 139
- structural barriers
information barriers, 303
process barriers, 305
relational barriers, 307
- structured partnerships, 310
- subordinate identity, 32-35
- substitutes, industry analysis, 132-133
- success, aligning (PLi), 106
- Supplier Development Program (SDP), 214
- supplier integration, via vested relationships, 226-228
- supplier power, industry analysis, alignment framework, 132
- supplier selection, 114-115
- suppliers
preferred provider model, 216
specialized investments, 208
- supply chain disruptions, 243
- supply chain effectiveness
IT infrastructure integration, 80-82
responsiveness, 81-82
- supply chain management advisory boards, 97
- supply chain management and, integration and, 4-6
- supply chain management software, 303
- supply chain planning, 174
- supply chains, DSI (demand and supply integration) across, 157-159
- supply disruptions, managing, 253-259
- supply review, DSI (demand and supply integration), 169-170
- supply risk, 241-242
managing, 253
mitigation, 246
network of, 242-243
recovery, 246-247
- supply side disconnects, 94, 96
- supportive norms, 33
- surveys, Integrating Marketing Strategy with a Firm's Internal and External Conditions. *See* Integrating Marketing Strategy with a Firm's Internal and External Conditions survey
logistics, 100
performance, 99-105
marketing strategy innovation, 273-275
PLi, 98-101
alignment of purchasing and logistics, 102
communication, 104-106
interaction is informal and unstructured, 103
procurement and logistics are disconnected, 101
purchasing, 100
- surveys purchasing performance relative to expectations, 105
- sweet spots, DSI (demand and supply integration), 166
- SWOT (strengths, weaknesses, opportunities, and threats), 136
- synchronization, 12
of flows, returns management, 198-200
- ## T
- tactical processes, DSI (demand and supply integration) aberrations, 161-162
- Tajfel, Henri, 30
- talent, 120
- Target Canada Inc., 79-80
- TCE (Transaction Cost Economics), 205, 207
- teams
empowerment, PLi, 116-118
multi-discipline supply teams, 110
- technological barriers, 86
- televisions, LCD panels, Equity Partnerships, 225
- tests, PLi, 120-121
- thinking, IBCPS (interest-based collaborative problem solving), 40
- Time Warner Cable, 140
- top-down culture change, 21-22
- total cost analysis, returns management, 194-195
- total value of ownership (TVO), 114-116
- Toyota, relational barriers, 306
- training
in collaborative communication, IBCPS (interest-based collaborative problem solving), 41
culture change, 23

Transaction Cost Economics (TCE),
205, 207
 transactional business model, 210, 225-226
 transformation management, vested
 sourcing business model, 232
 transmitted knowledge, 14
 trust, 307
 TVO (total value of ownership),
 114-116, 119

U

U2, Songs of Innocence, 283
 undercover heroism, 86
 unification, 83
 unified control, 13
 United States navy, 218-219
 University of Tennessee, College of
 Business supply chain audit program, 93
 upstream disruptions, 244
 upstream facing integration, 19

V

value chains, 34
 value focus
 aligning with operational execution, 74
 DSI (demand and supply integration), 68
 value recapture, 186
 value requirements, 48
 vested relationships, via supplier
 integration, 226-228
 vested sourcing business model, 219-221,
 226-228
 Five Rules
*clearly defined and measurable
 outcomes, 230*
focus on outcomes, 229
*focus on the what, not the how,
 229-230*
*insight versus oversight governance
 structure, 231-234*
pricing model incentives, 231
 rules for, 227-228
 VICS (Voluntary Interindustry Commerce
 Solutions), 159
 Volkswagen AG, 139
 Voluntary Interindustry Commerce
 Solutions (VICS), 159

W

Walmart, 136
 alignment of market and nonmarket
 strategies, 140-141
 barriers to integration, 304
 Wan, Lee Sang, 225
 Waste Electronic and Electric Equipment
 (WEEE), 187
 water supply, 260
 Coca-Cola, 240
 WEEE (Waste Electronic and Electric
 Equipment), 187
 Wheeler, Tom, 139
 Williamson, Oliver E., 205, 207
 winning partnerships, Procter & Gamble,
 269
 work enrichment, 278
 work processes, PLI, best practices,
 117-118

X-Y

Xinjiang Medical University, 139

Z

Zappos, autonomy, 290