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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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

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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

About the Authors

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.

Dr. Mark A. Moon is an Associate Professor of Marketing at the University of Tennessee's Haslam College of Business and former Head of the Department of Marketing and Supply Chain Management. Prior to joining the Haslam faculty in 1993, Dr. Moon earned his PhD from the University of North Carolina at Chapel Hill. He also holds MBA and BA degrees from the University of Michigan in Ann Arbor. Dr. Moon's professional experience includes positions in sales and marketing with IBM and Xerox. He teaches at the undergraduate, MBA, and Executive MBA levels, and teaches demand planning, forecasting, and marketing strategy in numerous executive programs offered at the Haslam College of Business. Dr. Moon's primary research interests are in Sales and Operations Planning (S&OP), demand forecasting, and buyer/seller relationships. He has published in many of the field's leading journals and conference proceedings. He authored *Demand and Supply Integration: The Key to World Class Demand Forecasting*, and *Sales Forecasting Management: A Demand Management Approach* with Dr. John T. (Tom) Mentzer. His consulting clients have included Honeywell, Goodyear, Corning, Walgreens, Whirlpool, Lockheed-Martin, and many other firms.

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

By Mark A. Moon, Chad W. Autry, and Daniel A. Pellathy[1]

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 interfunctional 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 Leuschner[7] and Mackelprang's[8] 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 team[20]

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" integration 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 though 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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