Competitive Supply Chains

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A Value-Based Management Perspective

2nd edition

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*To the loving memory of my dear mother,
Dr. Mürüvvet Aydın Yücesan*

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Preface

It is generally accepted that Supply Chain Management (SCM) started gathering steam in the early 1990s when a Kurt Solomon and Associates study concluded that the demand–supply mismatches were costing the US grocery industry \$30 billion a year.¹ Up until then, SCM was considered to be an obscure back office activity, typically labeled as “warehousing and distribution” or, a bit more gloriously, “logistics.” A ruthless wake-up call, \$30 billion represents a shocking number when one realizes that low-margin products such as toothpaste, broccoli, and flour are at stake in this industry. On the one hand, keeping additional stock to provide high levels of customer service is risky in this setting due to enormous variety in products and their short shelf-life. On the other hand, stock-outs, which are typically around 7% of sales for better managed companies, lead to lost sales not only for the grocery store but ultimately for the overall industry, including the retailer *and* the manufacturer, should the customer abandon the purchase altogether. It was quickly discovered that other industries were also facing similar challenges. Under such difficult circumstances, many industries have undertaken revolutionary initiatives in streamlining their go-to-market strategies. Over the past decade, a flurry of research, development, and deployment has transformed SCM into a mature discipline in its own right.

Within that period, numerous books and thousands of articles have appeared on the topic, contributing to the rapid advancement of the field. However, two gaps in the literature still persist. First, activities within the realm of SCM are typically viewed as cost centers, whereby cost minimization remains the key focus of most SCM streamlining efforts. To compound the problem, the divide between the performance metrics typically used in the trenches (such as inventory turns, order fulfillment rates, and order turnaround times) and the financial indicators typically monitored by the upper management and the investors (such as economic profit, return on invested capital (ROIC), and return on net assets (RONA)) remains wide. This book adopts a value-based management (VBM) perspective, in which SCM’s key mission is *value creation* and *capture*. SCM solutions are developed and deployed to create value for everyone who comes into contact with a company’s products and services. In this setting, “value” could be created by simply minimizing costs. On the other hand, there are situations in which

cost minimization simply destroys value for the stakeholders, necessitating alternative strategies. VBM therefore enables the adoption of a wider business perspective for SCM. Furthermore, such a perspective also allows us to map operational performance metrics to the financial performance indicators in a straightforward fashion, enabling the evaluation of whether or not the proposed supply chain solutions are ultimately value enhancing or value destroying.

While necessary, *value creation*, however, is not sufficient for *value capture*. There are many examples in which an innovative design introduced by one company has been successfully commercialized by another, leaving the original inventor with little profits. This, in turn, brings us to the second gap in the literature based on the popular adage that “competition is no longer between companies but between supply chains.” Implicit in this statement is the assumption that modern supply chains operate as a single well-coordinated entity, like a basketball team, with a clearly defined command-and-control structures. This might have been true in the early 20th century where many industries exhibited full vertical integration. Today’s supply chains, however, are ecosystems, with no clear governance—or command-and-control structure, consisting of independent organizations. As these “economically rational agents” interact with each other, there might be serious misalignments within the ecosystem due to diverging local priorities, which might hinder the performance of the overall supply chain. In other words, having a star player in each position does not necessarily guarantee victory as a team. The performance of the Dream Team representing the United States at the 2006 World Basketball Championships in Japan is a relevant benchmark for modern SCM. In many industries ranging from personal computers to airlines, different supply chain members display widely different profitability levels. This book therefore adopts a decentralized view of the supply chain and puts an emphasis on economic mechanisms to promote coordination and collaboration within this ecosystem, so that the value created by the supply chain is captured in an equitable fashion by all its members. In other words, we would not only like our basketball team to win but also make sure that all the players are recognized—and rewarded—for their contribution to the team effort.

Finally, it is important to realize that the supply chain solution, which achieves the desired targets in *value creation* and *value capture*, is necessarily temporary. As products have expiration dates and as processes become obsolete, supply chain solutions also have limited shelf lives. Changes in competitive forces, in customer preferences, in technology,

and even in legislature may render the existing supply chain solution inadequate. One must therefore keep an eye on these key drivers and not hesitate to go back to the drawing board when the existing supply chain solution can no longer support the changing business strategy. After all, supply chains deploy an organization's go-to-market strategy. As that strategy evolves, the supply chain solution must evolve with it.

Another novelty embodied in this book is the framework through which the material is presented. This framework is summarized in Figure P.1. The horizontal axis represents the scope of the book. It starts with a vision: VBM, the challenge of providing value to anyone who comes in contact with a company's products and services. This vision is operationalized through strategy formulation, which defines the company's business model, its affinity for product and process innovation, and its investment in developing and acquiring resources. The strategy is then deployed through key processes that are at the heart of supply chain management. These processes represent the concrete enablers of VBM. The focus is then on deployment with an explicit discussion of the technologies, structures, and skills required for the roll-out of effective supply chain solutions. The adoption of such a broad scope has a dual purpose. First, we wish to draw the attention of top decision-makers to the strategic role of SCM in *value creation* and *capture*, and put SCM on the CEO's agenda. Conversely, we would like to broaden the

Figure P.1 Value-based SCM framework for Coloplast

perspective of supply chain professionals by demonstrating explicitly the contributions they make to the firm’s overall strategy through the initiatives they undertake in designing, coordinating, and managing supply chains.

The vertical axis represents the scale of the book. It starts with the motivation by establishing the context of the problem to be addressed. An illustration in the form of a mini case study is then provided to render the discussion concrete. It is worth emphasizing that these illustrations will not come from frequently cited (and often abused) examples, but from companies such as ASML, Coloplast, CIBA Vision, PSA, PPR, Firmenich, Nissan, Syngenta, and Mattel, all best-in-class examples deserving broader exposure. Finally, we not only present alternative solutions to the problem at hand but also provide the technical details through models that provide the basis of the proposed solution. Such an approach guarantees both the relevance of the topics addressed in this book and the rigor underlying the proposed supply chain solution. The wide range of models we will use throughout this book is listed in Figure P.2. While models are necessarily simplifications of reality that allow us to focus on the key parameters of the decision at hand, they have one big advantage: they enable clear articulation of all the assumptions made in building the model. The discussion should then focus on the validation of those assumptions. Once this is done, models provide us with an objective platform for conducting our analysis. We have, however, paid particular attention so that the technical developments throughout the text do not distract attention from the main discussion.

Model	Application
Little’s Law	Pipeline inventory
EOQ (Wilson)	Batch sizing
Newsvendor	Safety stocks Supply chain coordination/contracting
Base stock policies	Cost-service trade-off
- Loss function	Expected lost sales
Linear programming	Supply chain configuration
Queueing	Service systems, capacity management
Poisson process	Failure events/rare events
Free cash flow	Value definition and cascading

Figure P.2 Modeling approaches used in the book

Hence, the reader can enter into the technicalities only when he/she feels necessary to do so.

Figure P.1 is an illustration from Coloplast, a Danish wound care company, whose vision is to be the preferred source of medical devices and associated services contributing to a better quality of life. Coloplast operationalizes this vision through innovation both in products (which provide improved functionality, hence higher comfort levels, to patients) and in processes (which develops not only efficient manufacturing capabilities but also an agile supply chain for quick deliveries). To this end, processes have been put in place to accelerate new product development and market introduction as well as to have a balanced product distribution on a global scale. All of these processes are based on sound materials management principles.

Introduction in this book is meant to provide the reader with a sneak preview of the topics that will be further developed in the book. It describes the end-to-end supply chain design challenges in agri-business with the aim of painting the big picture before drilling down into its many fascinating facets.

Chapter 1 makes the case for supply chain management as an enabler to deploy and execute an organization's go-to-market strategy. It also furnishes some of the working definitions.

Chapter 2 offers a concise definition of "value" from a financial perspective. Operational drivers of "value" are then determined with the objective of identifying those SCM initiatives that contribute to the *value creation* challenge of an organization. Chapter 3 then focuses on *value creation* by emphasizing the product, process, and supply chain design in a concurrent fashion. In particular, we emphasize the temporary nature of competitive advantage and the resulting necessity of continuously developing new supply chain solutions in the face of a constantly evolving competitive landscape. Many value-creating initiatives, however, entail a cost-service trade-off. To assess the magnitude of this trade-off, Chapter 4 introduces a materials management model. This model can be deployed not only to guide the positioning of a company's goods or services in the short run, but also to assess the impact of investments in new product, process, and supply chain design in the long run to mitigate the cost-service trade-off.

Chapter 5 focuses on *value capture*. In particular, it describes both short-term and long-term initiatives to encourage collaboration in a decentralized supply chain. SCM is an information-intensive discipline. Chapter 6 therefore summarizes the impact of information and communication technologies (ICTs) on SCM practices; it also highlights the

enhancing role of emerging technologies in SCM. Just like products, services are also conceived, produced, and delivered through supply chains. There are nevertheless significant differences between product and service supply chains. These differences are discussed in Chapter 7 along with guidelines of coordinating the two types of ecosystems. Chapter 8 offers some concluding comments.

A television advertisement for UPS at the height of the dot-com boom clearly showed the importance of effective supply chain strategies. The advertisement starts with a group of young entrepreneurs sitting in front of a computer terminal and counting down for the launch of their new web-based business. Once they go live, they start waiting for customer orders. The first customer order, signaled with a “bing” on their computer, is greeted with a wild cheer by all the entrepreneurs. The cheers grow wilder as the second, the fifth, the tenth, and the fiftieth order trickles in. However, as the trickling soon turns into a shower of orders, which cross the threshold of the thousandth customer order, their cheer quickly turns into deep anxiety: how are they going to deliver all these orders? This book therefore adopts the perspective that SCM should be viewed as the effective deployment of value-based business strategies.

Changes in the second edition

Supply chain management is a dynamic field where we are faced with new challenges and opportunities every day. The additions to the second edition reflect some of the key developments that have taken place since 2007. In particular, I start the book with an end-to-end supply chain design scenario that provides the reader with an overview of the challenges that will be addressed in detail later in the book. I have updated our statistics. I also have a crisper discussion on the operational drivers of value, one of the key pillars of our discussion. I have incorporated new topics such as risk management, contracting in the early stages of a product’s life cycle, and corporate social responsibility. I offer many new illustrations and examples that have been generated through repeated interactions with numerous supply chain professionals. I would like to thank them for making me part of their supply chain journey. Let me conclude by thanking Ms. Liz Barlow, who rekindled this project.