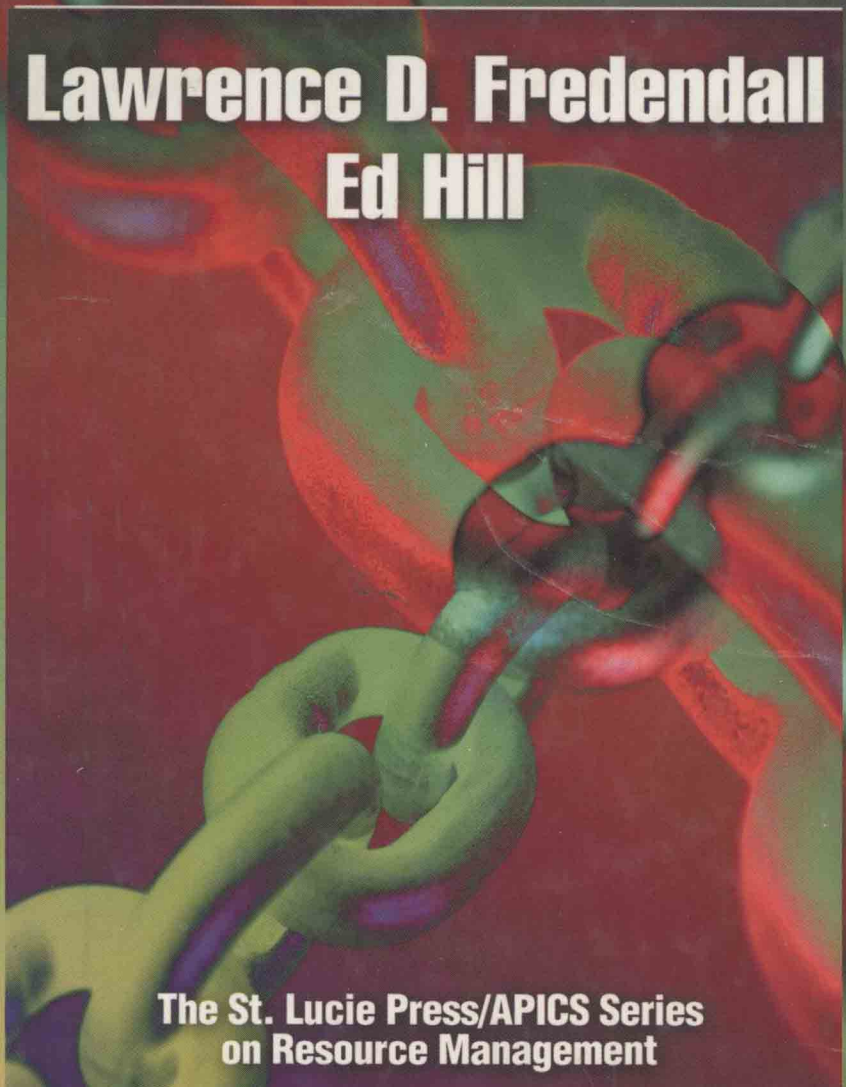
BASICS OF
Supply Chain Management

Lawrence D. Fredendall
Ed Hill



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on Resource Management

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Dedication

I wish to dedicate this book to my wife, Elaine Malinowski Fredendall
Lawrence Fredendall

To my wife, Patricia, and our daughter, Kelly, I dedicate this book
Ed Hill

Preface

Supply Chain Management (SCM) was once a dream, a concept more than a reality, since there were many necessary components of supply chain management that could not be fully achieved. A key barrier to full supply chain management was the cost of communicating with and coordinating among the many independent suppliers in each supply chain. An entire supply chain stretches from the creation of raw materials to the delivery of the finished consumer goods. Because firms are involved in many, many supply chains, active supply chain management is practical only for items essential to the firm's market success.

Managers are increasingly interested in actively managing their supply chains because of three environmental changes. First, technology has been developed to simplify communication between members of the supply chain. Second, new management paradigms have developed that are being widely shared among supply chain members so that it is simpler for these managers to coordinate their efforts. Third, the development of a highly trained workforce allows employees at each stage of the supply chain to assume responsibility and the authority necessary to quickly make decisions and take actions required to coordinate the supply chain.

While the three changes above make supply chain management possible, it is competition in the marketplace that is pushing firms to make SCM a reality. Those who master SCM gain a competitive advantage. So, SCM means money. And, SCM means jobs.

For the past 30 years the business world has been inundated by concepts and jargon. These include: Materials Logistics Management (MLM), Just-in-Time (JIT), Materials Requirements Planning (MRP), Theory of Constraints (TOC), Total Quality Management (TQM), Agile Manufacturing, Time Based

Competition (TBC), Quick Response Manufacturing (QRM), Customer Relationship Management (CRM), and many more. These ideas are not replaced or superseded by SCM. Rather, SCM incorporates all of these ideas to improve and manage the entire supply chain instead of just one firm in the supply chain.

Over the past 25 years, managers have learned to view their firms as a system of closely linked processes which deliver products and/or services to customers. Now managers are recognizing that their entire firm is just one link in a chain of firms whose purpose is to serve the customer. By increasing the integration of the entire supply chain, all the firms in the chain can increase their profits.

This book provides a basic introduction to help you understand SCM. It provides an introduction to the fundamental concepts in managing the flow of materials both inside an individual firm and throughout the supply chain. This book is organized in sections. The first section provides a brief history of supply chain management. The second section examines the fundamental business concepts such as operating environments, financial fundamentals, and an overview of the major managerial systems and tools used in SCM. The second section also examines customer linkages, including demand management. The third section provides an overview of the design and management of the transformation processes that will satisfy the demand. The final major section examines supply issues including inventory management principles, purchasing, and distribution.

The ability of a firm to engage in SCM places it onto the cutting edge for the 2000s and beyond. To gain an advantage through the use of SCM, each member of the chain will often have to prepare for some extremely significant changes in its business methods. To effectively improve service to the customer while reducing costs, each link in the chain must improve. The first step in doing this is to communicate the end customer's needs to all of the members of the supply chain. This requires a view of the entire system, which is often lacking. The second step is to have a management system in place which can communicate with the entire system and respond to information from the different components of the supply chain.

Information technology is a SCM tool. There is a surge of growth in interorganizational information systems, which means that firms are sharing information or at least data through their computer systems with other firms in their supply chain. For example, a junkyard can access a database that contains the records of inventory in stock at a large number of junkyards. This increases sales for all the junkyards involved while decreasing their inventory costs. It is information technology that allows this rapid communication

across organizational boundaries. However, to be effective this information technology must be accompanied by information protocols and appropriate management practices. One consequence of information protocols is that the information technology may serve to create standards in a wide variety of market segments, which in turn may create a large market where only small isolated markets existed before.

The creation of standards for interfirm communication has long been a barrier to greater supply chain integration. Individual firms may have sought to have particular standards created which benefit them and consequently standard creation has slowed communication exchange. This has been a barrier to the wider use of electronic data interchange systems. Now, some technology is reducing this problem. For example, web-based interactions reduce the issue of noncompatible technologies being used by firms.

Acknowledgments

I owe thanks to many people for their help on this project and for their generous advice and time. My wife, Elaine Malinowski Fredendall, deserves the most thanks for her patience during the long weekends when I worked on this instead of helping around the house. My children, Susan and Joseph, also need to be recognized for their support.

I want to thank Ed Hill for involving me in this project and Drew Gierman who stuck with us during the long lead-time. The examples used in the book have frequently come from plants and facilities where I have toured or worked. The training to write my share of the book was given to me by many people, but a major portion of it was from my mentor, Dr. Steven A. Melnyk. I also want to thank my father-in-law, Wit Malinowski, who spent hours finding articles and references for me.

The Authors

Lawrence D. Fredendall is an Associate Professor at Clemson University, where he teaches and conducts research about supply chain management, the theory of constraint, and quality management. He earned his Ph.D. in operations management from Michigan State University in 1991, after having received his MBA with an emphasis in materials logistics management from Michigan State University in 1986. He received the "Jonah" certification by the Avraham Y. Goldratt Institute in 1992. He has published research articles in *Production and Inventory Management Journal, Journal of Operations Management, International Journal of Production Research, European Journal of Operational Research, Production and Operations Management, ATI: America's Textiles International, Journal of Managerial Issues, APICS — The Performance Advantage,* and *Organization Development Journal.* He was the editor of the Supply Chain Management Department for *APICS — The Performance Advantage* for the 2000 publishing year.

Ed Hill is a Principal with Chesapeake Consulting, Inc. of Severna Park, MD. He served over twenty years in the apparel and textile industry after completing his education in industrial engineering from Mississippi State University and serving his country as a First Lieutenant in the U.S. Army during the Vietnam era. His manufacturing experience has included positions as Vice President of Operations, Director of Manufacturing, Director of Engineering, and Plant Manager before becoming the Director of Clemson University's Apparel Research Center in 1987. In this role, he was responsible for a $10 million research project in which he led several studies to boost the competitiveness of the U.S. textile and apparel industry. In 1990, he participated in the landmark project led by Dr. Eliyahu Goldratt and John Covington to apply the theory of constraints concepts to synchronize the entire soft goods supply chain. As a full-time consultant since 1995, he has worked with numerous

companies in a myriad of industries to apply synchronous flow and lean manufacturing techniques within supply chains of all sizes. He received the "Jonah" certification by the Avraham Y. Goldratt Institute in 1992.

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Contents

1 HISTORY AND INTRODUCTION