

Spink, John W, Supply Chain Management Introduction: Sourcing, Operations & Logistics, ISBN 978-x-xx-xx xx xx-x. IN PRESS, Chapter02 Front Matter and Chapter03 Corporate Strategy Management (version 95, 9/25/2021)

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Chapter 2 Front Matter

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2.1 Foreword: How to use this book

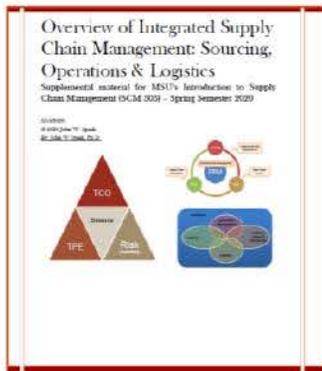
68 This book is a primer document created to be an overview of Integrated Supply
69 Chain Management (ISCM). As of Spring Semester 2020, this is a required resource for all
70 sections of the MSU Department of Supply Chain Management undergraduate course of
71 “*Introduction to Supply Chain Management*” (SCM 303). SCM 303 is a required course for
72 *all* the Business College undergraduate students at Michigan State University. Based on this
73 broad scope and thorough examination of a wide range of subjects, this is also a helpful
74 companion reference for practitioners.

75 This book meets the need for a basic, structured, concise overview of the general
76 concepts including how a business operates and makes decisions to support supply chain
77 management. That foundation enables the comprehension of the three main concepts of
78 procurement, operations management, and logistics. This overview, introduction, and
79 foundation helps provide context for understanding the rapidly emerging topics such as
80 environmental sustainability, product fraud vulnerability assessment management (including
81 intellectual property rights infringement of counterfeit product), enhanced traceability
82 (including blockchain, RFID, serialized codes, etc.), changing and supply chain models
83 (Amazonization, Uberization, “Curbside-pickup-ization,” etc.) and the application of
84 enterprise risk management to everyday decisions.

85

2.2 Acknowledgments

86 I would like to acknowledge many people who helped me during my transition to the
87 Department of Supply Chain Management and helping craft the requirements of SCM 303.
88 These colleagues shared their supply chain management expertise from their research,
89 application, teaching, and leadership in the Michigan State University Department of Supply
90 Chain Management curriculum.



Spink, John, *Overview of Integrated Supply Chain Management: Sourcing, Operations & Logistics*, ISBN 978-x-xx-xxxxxx-x. IN PRESS, Sections 3 (Date 6/1/2020, Version 60)

Chapter 3 CORE: Introduction–Corporate Structure & Supply Chain Management

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3.1 How an Enterprise Operates

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The focus of this book is to help understand the workings of an enterprise, which could be a company, a non-profit organization (NPO) or a non-governmental organization (NGO), or a government. The scope is for all types of supply chain related activities, from manufacturing products such as automobiles or food to managing services such as a bank or hotel.

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All enterprises are resource-constrained to some degree, and limited explicitly by financial constraints. Although serving customers leads to success, a company is a *financial* entity judged by *financial* measures. A non-governmental organization is constrained to some degree by a financial budget, if only to move volunteers or humanitarian aid to the areas of need. A government has a budget that is applied to the highest priority needs.

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In a company, the stakeholders, owners, or shareholders appoint the Board of Directors as their proxy to oversee the operation including a process for meeting the objectives, determining the risk tolerance and managing the countermeasures or control systems,. Remember, if you own individual stocks or invest in mutual funds, YOU are the “stakeholder” - YOU entrust the fund manager to manage YOUR savings by them

112 entrusting the company’s Board of Directors to protect YOUR investment. The Board of
113 Directors selects the corporate executive leaders (C-suite), such as the Chief Executive
114 Officer (CEO), Chief Financial Officer (CFO), Chief Operation Officer (COO), and others.
115 In some situations, there is also a Chief Risk Officer (CRO), Chief Security Officer (CSO),
116 Chief Compliance Officer (CCO), Chief Legal Officer which is often the General Counsel,
117 Chief Quality Officer or Chief Food Safety Officer, or others.

118 Essentially, the C-suite expects all risks and vulnerabilities to be addressed by (1)
119 implementing a process, (2) confirmation that the process is followed, and (3) that the
120 process is reviewed and updated.

121 The overall expectation from the C-suite and General Counsel is that the company’s
122 operations are managed efficiently and to the overall goals including a risk management
123 system including that it is competently implemented, and it is continuously updated. Due to
124 many reasons, the intense and explicit application of these concepts to day-to-day decision-
125 making and activities has increased. For example, at a recent food industry brand owner’s
126 food safety team leader meeting, their food industry Chief Legal Officer/ General Counsel
127 defined the goal of their risk management as:

- 128 • “to keep us [in the C-suite] informed and to avoid surprises,” and
129 • “we don’t want our board of directors to inform us of a problem or risk - we
130 want to be the one’s notifying the board of any problems and also hopefully be
131 presenting solutions.”

132 Later in the same meeting, the VP of Global Supply Chain Management stated that the
133 overall risk management goal is to:

- 134 • “avoid supply chain disruptions.”

135 They further said, to have “clear governance needs to define responsibility and accountability
136 for activities including risk management of very specific areas, such as food safety and food
137 fraud prevention.” The controls and competent systems will provide a long-term competitive
138 advantage to all stakeholders - and at least NOT to be a competitive DIS-advantage.

139 One way that enterprises determine resource-allocation is through first identifying
140 activities that are above their risk tolerance and then determining the optimal use of their
141 resources, which includes addressing these risks. Many firms use an “enterprise risk
142 management-type framework” to assess and support decision-making. For industry, this is

143 codified in concepts that will be review in great detail later such as COSO/ Enterprise Risk
144 Management (ERM). For governments, such as the U.S. Government, this ERM application
145 is published by the Government Accountability Office (GAO) in the Green Book.[1-4]
146 Without this type of enterprise-wide system, the determination of the risk tolerance, and risk
147 treatments, is *ad hoc* and often based on opinions or habits.

148 In general, Integrated Supply Chain Management is a critical function in the success
149 of an enterprise. Managing all activities is essential to assure the total product experience for
150 the customer, to balance this with the total cost of ownership, and to control variability, all
151 within the risk tolerance.

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153 3.2 How an Enterprise Chooses a Corporate Strategy - Defining the Value 154 Chain

155 *Every market is not profitable or defensible for every company.*
156 *Profitable and defensible markets continuously change. A key part of*
157 *how an enterprise chooses a corporate strategy is based on its own unique*
158 *assets, capabilities, and customers. This combination is the value-*
159 *proposition which is defined by the factors in the value stream. The*
160 *specific role of supply chain management includes the primary activities*
161 *of inbound logistics, operations, outbound logistics, and the support*
162 *activities of procurement and supporting information technology.*

163 An important business management consideration in business decision-making is
164 how an enterprise chooses a strategy which includes identification and assessment of the
165 contribution of each business function. Supply chain management is a part of the enterprise
166 that includes activities and contributions. The functions of a business can be defined as a
167 **value chain**, which are the “activities that are performed to design, produce, market, deliver,
168 and support its product.”[5] The first key concept in that consideration is the **value**, which is
169 “the amount buyers are willing to pay (measured by total revenue which is price and volume)
170 for what a firm provides to them.” [5] The second key concept is a **margin**, which is “the
171 difference between the total value and the collective cost of performing the value activities.”
172 [5] The final key concept that defines the series of activities (defined below as the “value
173 chain”) is the **value activities**, which are “the physically and technologically distinct activities

174 that a firm performs.” [5] As applied to these examples, the **cost** is the financial requirement
 175 to obtain process, manage, and distribute the goods to the customer. The **price** is the total
 176 charged for a customer to receive the product. The **margin** is “the difference between the
 177 total value and the collective cost of performing the value activities.” [5] A firm is **profitable** if
 178 “the value it commands exceeds the cost involved in creating the product.” [5] The cost and
 179 price terms are essential to understand the is a difference between a *low-cost* product and a
 180 *low price* product.

181 The role of the **cost of goods** (the cost of the raw materials, ingredients and any
 182 supplies) and **cost of manufacturing** (the cost to transform the product into the finished
 183 good) may – or may NOT – be a major influence on the bottom line revenue and margin of
 184 a firm. In some situations, the supply chain management impact on a business’s costs can be
 185 very high, such as 80+ percent of the total enterprise revenue. [6] In other situations, the
 186 impact can be minuscule or even only fixed overhead costs.

187 With this in mind, there is no right or wrong decision about how to position a
 188 company or to create a supply chain or the efforts to mitigate and prevent risks. Supply
 189 Chain Management is part of a broader value chain system.

190 It is important to continuously adjust the role and importance of Supply Chain
 191 Management in the success of the enterprise. Next, one way to look at an enterprise is based
 192 on the concepts created by Michael Porter in the seminal works “Competitive Strategy” and
 193 then “Competitive Advantage.” [5, 7]

194 ***Identifying the Value Chain***

195 These concepts all help define the optimal supply chain activities and investment
 196 strategy. The **generic strategy** is “creating value for buyers that exceeds the cost of doing
 197 so.” [5] Identifying the optimal structure of the value chain is defined by “total value, and
 198 consists of value activities and margin [profitability]” and are “the physically and
 199 technologically distinct activities the firm performs.” [5] Explained in another way, the value
 200 chain is “a basic tool for diagnosing competitive advantage and finding ways to create and
 201 sustain it.” [5]

202 Further, each **value activity** includes “purchased inputs, human resources (labor and
 203 management), and some form of technology to perform its function,” then it creates
 204 “information (such as buyer data or order entry), performance parameters (testing), and
 205 product failure statistics” and it “may also create financial assets such as inventory and

206 accounts receivable, or liabilities such as accounts payable” [5] . The *value activities* include
 207 “two broad types, *primary activities*, and *support activities*.”[5] . Further, with the primary
 208 and support activities, the *activity types* are identified as follows (Figure 3-1):

209 Value Chain “Primary Activities” include [5] :

- 210 • **Inbound Logistics:** the “activities associated with receiving, storing, and disseminating
 211 inputs to the product such as materials handling, warehousing, inventory control,
 212 vehicle scheduling, and returns to suppliers.”
- 213 • **Operations:** the “activities associated with transforming inputs into the final product
 214 form, such as machinery, packaging, assembly, equipment maintenance, testing,
 215 printing, and facility operations.”
- 216 • **Outbound Logistics:** the “activities associated with collecting, storing, and physically
 217 distributing the product to buyers, such as finished goods warehousing, material
 218 handling, delivery vehicles operation, order processing, and scheduling.”
- 219 • **Marketing and Sales:** the “activities associated with providing a means by which
 220 buyers can purchase the product and inducing them to do so, such as advertising,
 221 promotion, salesforce, quoting, channel selection, channel relations, and pricing.”
- 222 • **Service:** the “associated activities with providing service to enhance or maintain the
 223 value of the product, such as installation, repair, training, parts supply, and product
 224 adjustment.”

226 Value Chain “Support activities” include [5] :

- 227 • **Procurement:** “refers to the function of purchasing inputs used in the firm’s value
 228 chain, not to the purchased inputs themselves. *Purchased inputs* include raw
 229 materials, supplies, and other consumable items as well as assets such as machinery,
 230 laboratory equipment, office equipment, and buildings. [...] Procurement tends to be
 231 spread throughout a firm. Some items such as raw materials are purchased by the
 232 traditional purchasing department, while other items are purchased by plant
 233 managers, office managers, salespersons, and even the chief executive officer. This
 234 dispersion of the procurement function often obscures the magnitude of total
 235 purchases, and means that many purchases receive little scrutiny.”
- 236 • **Technology Development:** “every value chain embodies the technology, be its know-
 237 how, procedures, or technology embodied in process equipment.”

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- **Human Resource Management:** “consists of activities involved in recruiting, hiring, training, development, and compensation of all types of personnel.”
 - **Firm Infrastructure:** “consists of a number of activities, including general management, planning, finance, accounting, legal, government affairs, and quality management. Infrastructure, unlike other support activities, usually supports the entire chain and not individual activities.”

245 Value Chain “Activity Types” within the Primary and Support activities [5] :

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- **Direct:** “involved in creating value for the buyer, such as assembly, parts machining, salesforce operation, advertising, product design, recruiting, etc.”
 - **Indirect:** “make it possible to perform direct activities on a continuing basis, such as maintenance, scheduling, operation of facilities, salesforce administration, research administration, vendor record keeping, etc.”
 - **Quality Assurance:** “ensure that the quality of other activities, such as monitoring, inspecting, testing, reviewing, checking, adjusting, and reworking. Quality assurance is not synonymous with quality management because many value activities contribute to quality.”

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258 **Figure 3-1: The Business Function Concepts Including the Firm Infrastructure of Quality,**
 259 **Risk, Sustainability, and others in the Integrated Framework ("corporate") Strategic**
 260 **Perspective and Positioning (for more, see Porter's Wheel of Competitive Strategy, [7]).**

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262 *Selecting a Corporate Strategy*

263 The value chain insight helps an enterprise select the optimal corporate strategy to
 264 meet its goals. "Essentially, developing a competitive strategy is developing a broad formula
 265 for how a business is going to compete, what its goals should be, and what policies will be
 266 needed to carry out those goals." [5] The place in the marketplace where a company most
 267 optimally positions (market position) include a focus on "Sources of Differentiation" that
 268 consists of a contribution of the value chain and supply chain management. "Differentiation
 269 grows out of the firm's value chain. Virtually any value activity is a potential source of
 270 uniqueness. The procurement of raw materials and other inputs can affect the performance
 271 of the end product and hence [create marketplace product positioning] differentiation." [5]
 272 The specific functions have a unique role to play where "Operations activities can affect such
 273 forms of uniqueness as product appearance, conformance to specifications, and reliability.
 274 [...] The outbound logistics system can shape the speed and consistency of deliveries. [...]"

275 Value activities representing only a small percentage of the total cost can nevertheless have a
 276 major impact on differentiation.” [5]

277 Each enterprise has a unique set of assets, capabilities, capacity, and stakeholder
 278 requirements, so the corporate strategy is based on factors such as the value chain and
 279 company position in the marketplace. By understanding the value chain, then each function
 280 – such as supply chain management, procurement, sourcing, or logistics – can determine,
 281 calibrate, and optimize their activity.

282 3.3 Overview of Supply Chain Management

283 *There are many definitions of Supply Chain Management (SCM). The*
 284 *common scope includes the sourcing of materials, transforming, and*
 285 *providing a product or service to a customer, including communication*
 286 *along the way and measures or controls that stabilize the flow.*

287 The SCM business function is an essential business function since it can be upwards
 288 of 80% of the cost of a product. Also, that high percent of impact amplifies the financial
 289 benefit of even fractional improvements in the costs of goods sold, of moving or
 290 transforming the product, or moving and delivering the finished goods. While focusing on all
 291 activities as one system is considered an integrated supply chain, there are specific functions
 292 or types of activities.

293 Supply Chain Management Functions include:

- 294 • **Procurement (including purchasing and sourcing)** is the combined set of activities
 295 that include identifying and adding suppliers, bidding and establishing the business
 296 arrangement (traditional purchasing), managing the relations, and flow of product
 297 into and through the enterprise (traditional supply management), including the
 298 overall strategic planning.
- 299 • **Operations (operations management)** are the combined set of activities that
 300 transforms the incoming goods, on-time, and in the right quantity, into a finished
 301 good that can be sold to the customer.
- 302 • **Logistics (including material handling, storage, distribution, and reverse logistics)** are
 303 the combined activities of moving goods through from procurement through
 304 operations to the final customer. Logistics is often referred to as the overall role but

305 also specifically the internal movement, handling, and storage of products.
306 Distribution is commonly referred to as the movement of product from the
307 operations to the customer.

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309 Overarching programs help manage **Supply Chain Management Activities**.

- 310 • **Quality Management** is monitoring and managing the development and production
311 through the delivery of the product that meets customer needs. The customer needs
312 are often quite varied based on durability, reliability, timeliness, compliance with
313 specifications, and other factors.
- 314 • **Risk Management** is the monitoring and managing the unknowns or variables that
315 are inherent and omnipresent in the nature of the materials, production, products
316 and use as well as **outside disruptions** such as currency fluctuations, changing social
317 or political framework, natural disasters, accidental damage or losses, product-related
318 hazards or safety issues, **product fraud** or **counterfeiting**, and others.
- 319 • **Corporate Controls and Integrated framework controls** are monitoring and managing
320 the activities of the overall enterprise, including setting internal controls and
321 monitoring for compliance and deviation. This activity area includes sustainability
322 strategy and implementation, information technology systems, and others.

323 While these are separate functions with their own set of methods and standards, they
324 must operate together by Integrated Supply Chain Management. The SCM operates within
325 the overall corporate structure that includes marketing, management, finance, accounting,
326 sales, new business development, research and development, engineering, human resources,
327 legal, and others.

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3.4 Fundamental Supply Chain Processes

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Across the functions and activities, there is a coordinated and implemented supply chain management process. [5, 8] These processes are implemented across several or all of the SCM functions (procurement, operations, and logistics) and also often other business functions such as marketing, sales, and new business development.

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Another way to look at the integrated supply chain management concept is from the perspective of specific fundamental processes. There are eight fundamental supply chain processes [8]:

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- 1) **Demand Planning Responsiveness:** The assessment of demand and strategic design to achieve maximum responsiveness to customer requirements.
- 2) **Customer Collaboration:** The development and administration of relationships with customers to facilitate strategic information planning, joint planning, and integrated operations.
- 3) **Order Fulfillment and Delivery:** The ability to execute superior and sustainable order to the delivery performance and related essential services.
- 4) **Product or Service Development Launch:** The participation in product and service development and lean launch.
- 5) **Manufacturing Management and Customization:** The support of manufacturing strategy and facilitation of postponement throughout the supply chain.
- 6) **Supplier Collaboration:** the development and administration of relationships with suppliers to facilitate strategic information sharing, joint planning, and integrated operations.
- 7) **Life-Cycle Support:** The repair and support of products during their life cycle; includes warranty, maintenance, and repair.
- 8) **Returns Management and Reverse Logistics:** The return and disposition of inventories cost-effectively and securely.

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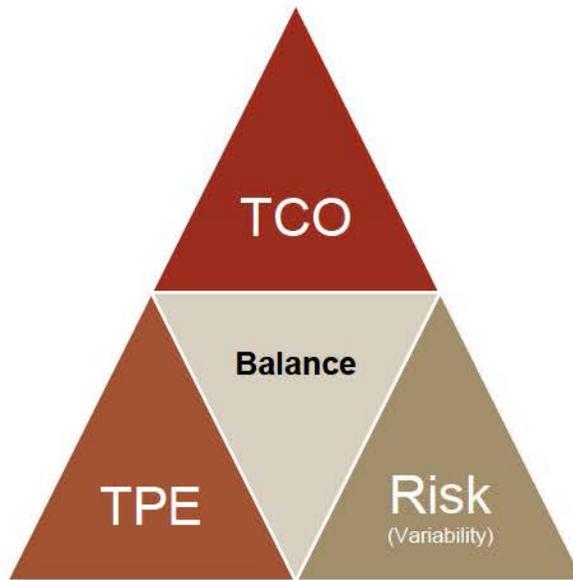
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Together the SCM functions are coordinated by the SCM activities and then implemented in the SCM processes. A corporate management system coordinates the implementation and management through Internal Controls and an Integrated framework based on the strategy defined in terms of (1) total cost of ownership (TCO), (2) the total

360 product experience (TPE), and (3) controlling the variabilities or risks within the corporate-
 361 defined risk tolerance.



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363 **Figure 2: Decision-making pyramid of the balanced of TCO-TPE-Risk**

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