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# The Wharton School Study of the Health Care Value Chain

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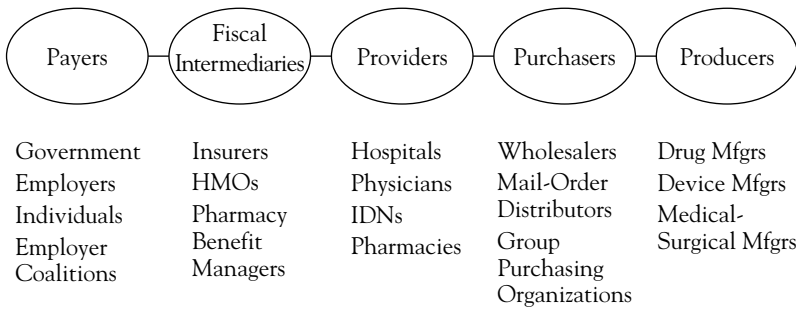
## Focus of This Book

This book analyzes developments in the U.S. health care value chain over the past decade. Wharton School researchers spent three and one-half years (January 1998–June 2001) studying three major players at various stages of the value chain: producers (product manufacturers), purchasers (group purchasing organizations, or GPOs, and wholesalers/distributors), and health care providers (hospital systems and integrated delivery networks, or IDNs) (see Exhibit 1.1). Manufacturers make the products, GPOs purchase them in bulk on behalf of hospitals, distributors take title to them and deliver them, and providers consume them in the course of rendering patient care.

In conducting this study, the Wharton School research team had five broad aims:

1. To profile the major segments in the health care value chain and some of the key players within them, their resources and capabilities, and their recent history;
2. To document how the value chain currently operates;
3. To identify and analyze the strategic and competitive issues facing the three major players;

Exhibit 1.1 Health Care Value Chain



4. To assess the impact of e-commerce on the value chain; and
5. To assess future prospects for partnerships and improved efficiencies between value chain players.

We believe that an understanding of the first two topics is essential for addressing the latter three.

Our analysis is more strategic than operational. We do not provide comparative benchmarking data or measures or standards of supply chain performance, nor do we identify specific time- and cost-saving opportunities for improvements in work-flow processes. Instead, we seek to understand the bases of cooperation and competition along the value chain, the sources of efficiency in contracting between suppliers and providers, and the emerging best practices and strategic alliances along the value chain. Our overall aim is to determine whether “extended enterprise” models of supply chain collaboration found in other industries can develop in health care.

The book is addressed to both academic researchers and industry executives. We hope academics will find it a useful and comprehensive introduction to a huge segment of the health care industry that is rarely studied, as well as an analysis of the multiple problems in strategic alliance formation in health care. We hope executives will find it helpful for better understanding the motivations of their trading partners and the opportunities for working with them in cooperative endeavors.

## Why Study the Health Care Value Chain?

Several major developments in the health care industry during the 1990s prompted interest in the health care value chain. These developments encompassed vertical integration, horizontal integration, managed care pressures, changes in federal reimbursement, the rise of e-commerce, and the passage of the Health Insurance Portability and Accountability Act (HIPAA) in 1996.

First, provider organizations (hospitals and hospital systems) vertically integrated into the health insurance business (for example, starting up HMOs) and the ambulatory care business (for example, acquiring physician practices), and in the process developed *integrated delivery networks*, or IDNs. Such efforts represented attempts to integrate downstream toward the patient, capture a greater portion of patient flows and insurance premiums, and develop some countervailing power vis-à-vis health maintenance organizations (HMOs). With a few notable exceptions, such efforts were spectacularly unsuccessful. Providers instead began to realize there may be opportunities to improve their financial position by partnering with upstream value chain players and, in some cases (for example wholesalers/ distributors), integrating with them.

Second, every major player along the value chain horizontally consolidated. Hospitals merged with one another or joined systems; their group purchasing organizations (GPOs) merged to form super GPOs; distributors merged to build mega warehouses and achieve economies of scale; and product manufacturers merged to gain market share, pool capital and sales forces, and deal with the other consolidated players just mentioned. By the start of the new millennium, it was unclear what were the resulting contracting dynamics within the new, consolidated chain. Was it more competitive or less competitive?

Third, provider organizations were rocked by reimbursement pressures emanating from large HMOs, which had merged to develop greater bargaining leverage with employers and to squeeze

providers on payments. Providers were also rocked by reductions in both inpatient and outpatient Medicare payments resulting from the Balanced Budget Act (BBA, 1997) and the Balanced Budget Relief Act (BBRA, 1999), which included the Ambulatory Payment Classification (APC) system.

Fourth, the rise of e-commerce promised a “sea change” and “paradigm shift” in how trading partners were to transact business. Business-to-business (B2B) models using Web technology were sold as the solution to all of the industry’s problems and inefficiencies. The new technology would speed up transactions; provide visibility of products and information along the entire chain; and eliminate duplication, paperwork, and processing errors.

Finally, HIPAA developed standards for providers to follow with regard to the format, use, and security of electronically stored and transmitted health care information. These standards had enormous implications for reducing overhead and administrative costs, for the development of electronic commerce, for transacting business with trading partners, and for improving the information available for decision making.

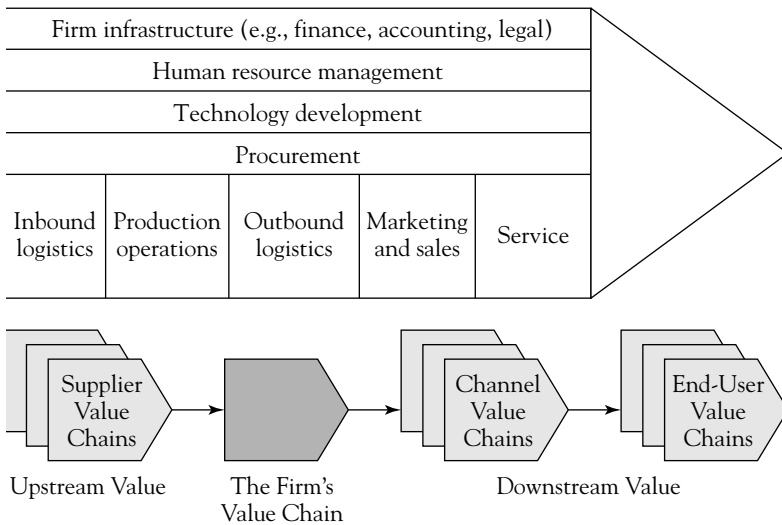
Whereas before the value chain was an unimportant side issue, the events just mentioned collectively propelled value chain issues to the forefront. The increasing importance is reflected in recent consulting firm studies of value chain improvements and efficiencies using e-commerce,<sup>1,2</sup> and funding for this investigation by a consortium of large IDNs known as the Center for Health Management Research (CHMR).

In addition to these developments in health care, the 1990s witnessed the formation of strategic trading alliances in the U.S. auto industry. These alliances, also known as *extended enterprise supplier networks*, brought together suppliers of component parts with large auto manufacturers to collaboratively improve quality, reduce costs, and develop competitive advantage.<sup>3</sup> Such strategic alliances have been held out as examples for the health care industry to follow.

## What Is a Value Chain?

Michael Porter, an economist at the Harvard Business School, has popularized the term *value chain* among academic circles to mean the entire production chain from the input of raw materials to the output of final product consumed by the end user.<sup>4,5</sup> This chain is called a value chain because each link in the chain adds some value to the original inputs. There are really two value chains here. The first concerns the stream of productive activities *within* a given firm that allows it to manufacture a product or render a service (see Exhibit 1.2). Thus, a firm acquires inputs (for example, raw materials, labor, capital, and so on), integrates and processes them in a throughput stage, and then produces its outputs. The second value chain includes the stream of activities *across* firms, where the outputs of one set of firms become the inputs for another set of firms. Thus, a firm has input suppliers, industry competitors, distributors, and end customers. An analysis of the value created within a given firm helps to identify its contribution to the value created along the interfirm supply chain.

Exhibit 1.2 Michael Porter's Value Chain



Source: Michael E. Porter. *Competitive Advantage: Creating and Sustaining Superior Performance*. Copyright © 1985, 1999. Adapted with the permission of the FREE Press, a division of Simon & Schuster, Inc.

## What Is a Supply Chain?

In industry, the term *supply chain* tends to be used more frequently than *value chain*. A supply chain is a virtual (as opposed to vertically owned) network “that facilitates the movement of a product from its earliest point of production, through packaging and distribution, and ultimately to the point of consumption.”<sup>6</sup> The supply chain is thus the path traveled by the product; each stop along that path defines a link in the supply chain.

Supply chain networks may operate to both (1) “push” manufactured products through the chain using sales forces and promotional campaigns, and (2) “pull” products through the chain to continually replenish retailers’ inventories and meet customer demand.<sup>7-9</sup> In the former model, manufacturers promote and sell as much product as they can to customers. In the latter model, customers demand products from the preceding link in the chain; those vendors then become responsible to manage the customer’s inventories.

## Why Do Value and Supply Chains Exist?

Why do value and supply chains exist? There are at least two explanations, derived from industrial organization theory and organizational theory. First, supply chains exist because there is little vertical integration of manufacturers into the distribution and delivery of their products to the end customer. Vertical integration is low because manufacturers believe that the costs of transacting with the marketplace for distribution and delivery are much less than the costs of attempting to take distribution in-house and coordinating all of these exchanges using hierarchical means. That is, manufacturers believe that it is cheaper for them to “buy” distribution services from product wholesalers in the marketplace rather than “make” distribution services in-house. Consequently, manufacturers have elected not to enter the distribution business but rather let specialist firms produce these services for them.

Second, because manufacturers have left the provision of distribution services to others, they are now interdependent with external firms over whom they exercise no hierarchical or managerial control. Consequently, they need to develop contractual or strategic alliance relationships with these specialist firms in order to get their products to the end customer. Supply chains thus exist to coordinate and manage the exchanges of firms that are interdependent.

## **What Are the Objectives of a Value Chain?**

Across firms engaged in trading relationships, a value chain is concerned with several theorized objectives:

- Optimizing the overall activities of firms working together to create bundles of goods and services
- Managing and coordinating the whole chain from raw material suppliers to end customers, rather than focusing on maximizing the interests of one player
- Developing highly competitive chains and positive outcomes for all firms involved
- Establishing a portfolio approach to working with suppliers and customers; that is, deciding which players to work with most closely and establishing the processes and information technology (IT) infrastructure to support the relationships<sup>10</sup>

That is, value chains are supposed to be collaborative partnerships between adjacent players engaged in economic exchange. Such collaborative activity includes coordinated planning of production and distribution to meet the customer's needs on a just-in-time basis that reduces inventory levels and delays in product availability. It is also designed to create a lowest-total-cost solution for the end customer

and the manufacturer. Lowest total cost is achieved using demand planning, which relies on information gathered from the customer that “pulls products.” Demand planning works backward from the customer toward the manufacturers and their suppliers and original equipment manufacturers (OEMs). This is all in contrast to traditional supply chain management, which starts with the manufacturer that “pushes product” (for example, using marketing and advertising campaigns) and works forward toward the customer. Here the manufacturer’s aim is not achieving lowest total cost but increasing product sales, greatest product differentiation, and lowest delivered cost.

## Value Chains and Extended Enterprises

Value chains are also supposed to develop as strategies of competitive advantage in which one set of trading partners (input supplier–product manufacturer–distributor) seeks to create more value (for example, higher quality and/or lower-cost products and services) than a rival set of trading partners. Recent research on value chain alliances in the auto industry suggests some of the essential ingredients for success.<sup>11</sup>

One key ingredient is dedicated asset investments in one’s supply chain partners in order to increase productivity. These can include dedicated managers and account representatives who accumulate substantial understanding and know-how through long-standing relationships with trading partners. Another type of asset investment is the development of capital investments tailored and customized to a specific trading partner.

A second key ingredient is effective management of knowledge and knowledge flows among trading partners. This requires sharing of information (both explicit and tacit knowledge) rather than secrecy. This is accomplished through supplier associations, learning teams, on-site consultation, joint-study groups, problem-solving teams, and interfirm employee transfers. In this manner, suppliers



provide input to product development and process improvement initiatives.

A third key ingredient is trust among trading partners. The presence of trust lowers the necessity for contract enforcement and surveillance and thus reduces transaction costs. Specific means to foster trust include selection of suppliers based on their capabilities and track record for performance (rather than competitive bidding) and previous contracting relationships, establishment of long-term contracts, stability of employment of managers involved in contracting, extensive two-way communication, financial investments in one another, and evaluation of the relationship on a broader scale than just unit price of inputs.

Research on the auto industry suggests that the presence of these three ingredients allows the formation of extended enterprises that span manufacturers and their suppliers. Such enterprises achieve competitive advantage over other manufacturers (that lack such alliances) in terms of the speed of product development, product development costs, transaction costs in procurement, product costs, quality, market share, and profitability.

### **Do Value Chains Exist in the U.S. Health Care Industry?**

In the health care industry, this view represents more aspiration than reality. Despite all of the attention paid to the health care supply chain over the past decades, few of the elements just outlined exist today. To be sure, there are organizations operating at each stage in the supply chain (see Exhibit 1.1). Among producers (manufacturers), there are pharmaceutical companies, medical-surgical products companies, device manufacturers, and manufacturers of capital equipment and information systems. Among purchasers (intermediaries) there are group purchasing organizations, pharmaceutical wholesalers, medical-surgical distributors, independent contracted distributors, and product representatives

employed by some manufacturers. Among organized provider customers (hereafter referred to as *providers*), there are hospitals, systems of hospitals, integrated delivery networks (IDNs), and alternate site facilities (for example, physician offices and ambulatory surgery centers). What is lacking, however, is coordinated effort among these parties, widespread strategic alliance formation, knowledge sharing, interfirm trust, and competing value chains oriented to delivering the greatest customer value at lowest total cost. Indeed, some industry executives baldly state that the word *partner* does not really exist.

Everard has recently made a similar point, claiming that supply chain management does not exist in the health care industry. He defines supply chain management as

the intervention of supply chain links and players in determining the cost and value of exactly when and how a product moves, in what quantities it is moved, who moves it and how it is moved, who stores it and how it is stored, and when and how it is made available to those who consume or use it. Everything that happens to a product as it moves through the chain either adds cost or reduces cost. It either adds value or reduces value. The ultimate goal for any product moving through the chain is to reduce cost and add value at the same time.<sup>12</sup>

Within health care, information on the value or cost added at each link is severely lacking. Indeed, the current state of knowledge on product value/cost among producers may be so low that meaningful knowledge sharing is impossible. Moreover, there is some consensus that multiple links may perform duplicative functions or wasteful, non-value adding functions due to this lack of information or reluctance to share information. Finally, there is some consensus that the supply chain acts more to push products down the chain rather than pull them from the customer, due to this lack

of information at the provider level at the point of consumption. Consequently, each stage holds inventory to prevent stockouts, and providers order products based on just-in-case inventory planning. Moreover, the “product push” mentality creates distrust among providers, who believe that manufacturers are only interested in selling their products.

During the mid-1990s, several prominent supply chain participants formed a consortium called the Efficient Consumer Health-care Response (EHCR) to combat these problems in the U.S. health care supply chain.<sup>13</sup> They identified an agenda of issues to be addressed, including

- Paper shuffling (manual requisitions and purchase orders, paper-based pricing information)
- Lengthy product ordering and delivery cycle times
- Multiple product handling activities
- Excessive inventory carrying costs
- Lack of information sharing among trading partners
- Little information on product location
- Little information on product utilization
- Operational (rather than customer) focus
- Pressure from managed care organizations to cut short-term costs
- Lack of trust between trading partners
- Lack of complete implementation of electronic commerce

Unfortunately, initiatives such as EHCR have yielded little fruit in terms of concrete partnerships and total-cost reduction efforts

(see Chapter Two for more details on the activity of EHCR). Similarly, consolidation efforts by distributors and organized hospital buyers (GPOs) have produced some documented savings and efficiencies in portions of the supply chain without promoting systemic improvements or concerted efforts to reduce total costs. Finally, the advent of e-commerce and the rise of B2B models sparked some short-term interest in health care supply chains on Wall Street but there are few documented savings to date.

### **What Is Health Care's Problem?**

There are several explanations for the health care industry's shortcomings as a value chain. First, unlike other industries, products are often ordered by workers on the front line of health care delivery, such as physicians, nurses, and so on. Purchasing is thus not an organizational competence, let alone a core competence, but rather the domain of non-businesspeople. Products are ordered in a way that maximizes their availability when needed, rather than minimizes the costs of holding inventory. Moreover, the end user ordering products is not typically the buyer (that is, paying for the product). Product demand is thus based heavily on the clinical preference of physicians rooted in their medical training, not on any formal cost-benefit analysis or budgetary constraint. Under the older cost-plus reimbursement environment (prior to DRGs), it did not really matter what the physician ordered or what the hospital paid for supplies. Despite the passage of the Prospective Payment System in 1983, this attitude may still be part of the culture and mentality of older generations of practitioners.

Second, the provider industry overall is largely based on nonprofit ownership. Until recently, there has been no real emphasis on budgeting, and no culture of process improvement to reduce costs. Business practices have crept into the system incrementally over time and have encountered strong resistance from professional norms of patient care and provider autonomy, as well as public goals

regarding patient access and quality of care. Thus, professional training in procurement and logistics has never been a hallmark among providers, given the prominent role of clinicians and their preferences for branded items. Moreover, since a heavy portion of provider revenues flow from federal and state governments, some believe providers have developed a welfare mentality rather than a strong profit-and-loss mindset. In this regard, the BBA is seen as “kicking providers off the welfare rolls.” Nevertheless, providers have been buffered from this rude shock by philanthropic donations, their foundations, and the rising value of their investments due to the surging stock market in the late 1990s.

Third, despite all of the consolidation, it is still a fragmented industry with no real leadership at any stage. Fragmentation complicates the task of connecting the thousands of parties involved at each stage in the chain, and standardizing the formats and content of their business transactions. Fragmentation also makes it difficult for one large, leading firm to catalyze the rest of the industry by changing the business model (for example, Wal-Mart). Coupled with this fragmentation is decentralization of decision making to front-line professional workers and moderate decentralization of provider systems.<sup>14</sup> Consequently, there are lots of autonomous hospital systems and IDNs that themselves are composed of autonomous units and professional fiefdoms within.

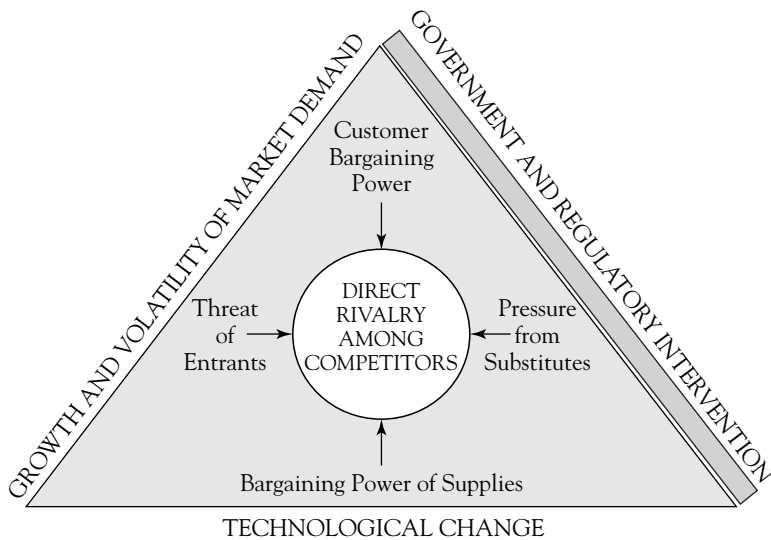
Fourth, providers have historically made their technological investments in patient care rather than information systems and infrastructure. Procurement and other functions are based in dated legacy systems, with little direct connectivity with manufacturers. Product master catalogs are often paper based, and their contents (product descriptions, prices) typically differ across players in the chain due to time lags in relaying and uploading new product and contract information. The result is a lot of inaccurate data and thus errors in business transactions. There are few widely accepted industry standards regarding product identifiers or communication standards, and few decision-making support tools to assess product

spending and utilization, particularly at the point of care. All of this is deadly for an industry that is transaction intensive and facing an exploding knowledge domain.

As a consequence of these factors, the health care industry has been slow to change. Indeed, nonprofit ownership and government regulation buffer health care from market forces. The nonprofit basis has retarded flows of capital, recruitment of business-trained professionals (for example, in IT), and investments in IT needed for change to occur. The presence of third-party payment buffers physicians and patients alike from the immediate financial consequences of their decisions. The presence of professional and accrediting bodies resists the incursion of market forces and any changes that threaten professional prerogatives. And the regionally based character of health care delivery resists uniform technological solutions and standards.

Not surprisingly, analyses of the health care industry do not usually rely on Porter's value chain framework (Exhibit 1.2). Instead, they focus on Porter's "Five Forces" framework (see Exhibit 1.3),

Exhibit 1.3 Porter's Five Forces



Source: George S. Day. *Market Driven Strategy: Process for Creating Value*. Copyright © 1990, 1999. Reprinted with the permission of the FREE Press, a division of Simon & Schuster, Inc.

which emphasizes competitive rivalry, supplier and customer bargaining power, and the threat of product substitutes and new entrants to the industry.

## **Where to Focus an Analysis of the Health Care Value Chain?**

An analysis of the health care value and supply chain must consider both types of value chains described in Exhibit 1.2: the transformation of inputs into outputs at the firm level (value created by the individual firm) and the exchanges between suppliers, distributors, and customers at the interfirm level (stages of value creation as products and services are transferred from producers through intermediary purchasers toward provider customers). Such a dual focus is important for a simple reason: firms at stage *X* of the value chain may or may not engage in economic exchanges or strategic alliances with firms at an adjacent stage *Y* of the value chain, depending on their assessment of the internal capabilities of firms at stage *Y* to add value. Thus, to some extent, an analysis of the health care value chain requires an analysis of individual firms and their strategic capabilities.

However, a more critical requirement is the analysis of the functions performed by firms at each stage. That is, researchers must analyze what are the contributions of distributors and GPOs to the value of the products manufactured by suppliers. For example, during the past twenty years, many supply chain management functions have migrated from the product suppliers and their hospital customers to distributors.<sup>15</sup> Similarly, many of the purchasing functions have migrated from hospital customers to their GPOs. What value do these intermediaries add to explain their growing ascendance in the supply chain? Such an analysis is important not only for explaining their role, but also for critically assessing the possible disturbance to their role by e-commerce and the trend toward disintermediation in other industries. In the recent past, e-commerce threatened to

shift functions away from GPOs to B2B firms, while disintermediation threatened to shift functions away from distributors.

In addition to functions, the analysis of the supply chain requires an analysis of the various flows within it.<sup>16</sup> There are three critical flows: products, money, and information. Players in the supply chain contest access to and control over these three flows. Thus, IDNs may seek to perform group purchasing and product distribution activities in-house to control product flows to the customer and capture administrative fees earned by their GPOs. Similarly, distributors may engage in forward vertical integration strategies toward the customer to gain information on customer product use and then seek to sell that information to manufacturers of the products.

Our vantage point for studying the supply chain is the IDN. The IDN perspective is adopted for several reasons. First, all supply chains are relative from the perspective of the observer. What is a supply chain to one company (an IDN) is a distribution chain to another (a pharmaceutical manufacturer). We take the perspective of IDNs as the ultimate customer because they account for the single largest portion of national health care spending (\$390.9 billion, or 32 percent, of total national health expenditures in 1999), roughly 45 percent of which is nonlabor expense. Second, fifteen IDNs funded the project through the Center for Health Management Research, a consortium formed under the auspices of the National Science Foundation (NSF) to promote collaborative research between industry and academia. Industry participants (our sponsoring IDNs) include Henry Ford Health System, Intermountain Healthcare, Fairview, Baylor Healthcare, Catholic Healthcare West, Daughters of Charity, Sisters of Providence, SSM, Mercy Health Services, Northwestern Healthcare, Summa, Aurora Health Care, Catholic Health East, Samaritan Health Services, and Virginia Mason Medical Center. Third, the IDN focus allows us to delimit the boundaries of the project to manageable dimensions. We thus consider the relationships of pharmaceutical firms with institutional customers (but not with retailers) and the impact of



business-to-business models (but not business-to-consumer) on the supply chain.

## Study Methodology

The study relied heavily on information provided by informants from a broad sample of firms collected over a period of three and one-half years. Some detail is presented in the paragraphs that follow.

### Informants

Information for the study was gathered primarily from personal interviews. Between January 1998 and June 2001, we interviewed executives at several major firms across the health care value chain (see Exhibit 1.1). Among product suppliers, we visited pharmaceutical manufacturers, medical-surgical supply manufacturers, and device manufacturers. Among intermediaries, we visited both pharmaceutical and medical-surgical wholesalers, as well as GPOs and some of their B2B technology companies. Among providers, we relied on our IDN sponsors.

Our informants spanned a wide range of functional areas, but typically included the vice presidents or directors for sales, distribution, national accounts, marketing, contracts, strategic sourcing, purchasing, global requirements planning, group planning and marketing, supply chain management, and information management. Interviews were conducted at the sites of our sample firms. Case studies were constructed from field notes for each firm we visited and were shared with those interviewed to ensure accuracy and to protect confidential information.

We conducted structured interviews using the interview protocol contained in Exhibit 1.4. Due to the protocol's length, we ascertained ahead of time which informants were best suited to answer which questions. In most cases, several informants discussed each question to ensure the reliability and comprehensiveness of our field data.

Exhibit 1.4 Specific Research Questions

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*Group Purchasing Organizations*

1. How do suppliers differentiate between classes of GPOs:
  - a) true GPOs vs. owned GPOs vs. IDNs?
  - b) national GPOs vs. regional vs. local?
2. How do suppliers differentiate between specific GPOs within each class?
3. What features of GPOs are attractive to suppliers? Which GPOs possess these features?
4. What determines whether one GPO gets a better deal than another GPO?
5. Do suppliers ever use “most favored nation” contracting?
6. How big does a GPO/system have to be in order to be noticed by a supplier? How does the supplier weigh the GPO’s size versus compliance rate?
7. How do suppliers view contract administration fees? What is their value?
8. What are the benefits of single vs. multi-source contracts?
9. Are GPOs tending toward restraint of trade?
10. How will the Internet (and other electronic commerce) change the role performed by GPOs?
11. How do GPOs differentiate their services to their members?
12. What is the GPO’s strategic advantage? How do they maintain it?
13. How do GPOs view the manufacturers and distributors they deal with?
14. How do GPOs justify their contract administration fees (CAFs)?

*Wholesalers/Distributors*

1. What are the operational efficiencies for manufacturers who rely on distributors? What are the problems?
2. What are the needs and expectations of distributors? What are their views regarding number of delivery points in an IDN?

3. Are distributors willing to work through these logistical problems with GPOs/systems?
4. What other value-adding services do distributors bring to the table?
5. How do suppliers and distributors view firms like Penske Logistics which perform some of the distributors' traditional functions (transportation)?
6. What threat do drug manufacturers see in the trend by drug wholesalers to offer a source product directory?

*Product Manufacturers*

1. Who is the customer: GPO, system, hospital?
2. What are suppliers doing to recover their costs from discounts?
3. What reengineering have suppliers undertaken here?
4. How do suppliers view distributors' reductions in the variety and number of product lines sold to systems as part of their cost management and standardization effort?
5. What are emerging best practices in supply chain management?
6. Do suppliers believe there are higher costs of doing business with IDNs, due to the multiple parties that must come to the table?
7. What are suppliers doing to reduce turnover of national account representatives which make partnerships difficult?
8. Can account representatives speak for the entire supplier corporation and its many divisions?
9. Where does decision-making authority for contract pricing reside in the supplier firm?
10. What is the GPOs' value-added to manufacturers?

*Integrated Delivery Networks (IDNs)*

1. Do providers have any advantage in belonging to multiple GPOs?
  2. What are emerging best practices in supply chain management?
  3. How will the Internet (and other electronic commerce) change procurement?
  4. What is the GPO's value added for IDNs?
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We supplemented the information gathered from the interviews with a review of the literature on supply chain management (SCM) in industry as well as in health care specifically. We also attended several industry conferences on supply chain management in health care and the impact of e-commerce. Finally, we conducted case studies based on telephone interviews of provider systems that are seeking to serve as their own distributors and GPOs. Insights from these activities are incorporated into the subsequent chapters.

### **Project Timeline**

Phase I of the project (January–December 1998) represented a pilot study of eight manufacturing and wholesaler firms along the value chain to investigate these issues. Phase II of the project (January 1999–December 2000) extended the study to six more pharmaceutical, medical-surgical, and device manufacturers and drug distributors to increase the reliability and validate the earlier findings; three GPOs and two B2B start-up firms to study new issues regarding the Internet and group purchasing; and four IDNs that had become involved in group purchasing and product distribution. Phase III of the project (January–June 2001) was devoted to preparation of the manuscript and revisions based on shakeouts in health care e-commerce and other segments. Our findings reflect the state of the health care supply chain as of early July 2001.

### **Sample of Firms**

Exhibit 1.5 lists the firms interviewed during Phases I and II of the project (excluding the IDNs). We have attempted to collect information from a broad sample along two dimensions: type of product handled (pharmaceuticals, medical devices, and medical-surgical supplies) and role in the supply chain (manufacturer, wholesaler or distributor, and GPO). Two firms did not wish to be identified and are referred to here as *Big Pharma* and *Big Med-*

Exhibit 1.5 Sample of Firms: Phases I & II

Phase I	Phase II
Allegiance Corporation	Abbott Labs
Cardinal Health	Baxter
DePuy	Becton Dickinson
Merck	Bergen Brunswig
Medtronic	Tenet/BuyPower
3M	Eli Lilly
Big Medical-Surgical (anonymous)	Novation
Zimmer	Premier
	Big Pharma (anonymous)
	Broadlane
	Neoforma

*Surg.* The firms studied are arrayed along these two dimensions in Exhibit 1.6. Many of the major value chain players are represented in our sample of firms. As Exhibit 1.7 illustrates, we have included eight of the top twenty health care firms, and eleven of the top thirty, as ranked by total revenues in 1998 when the study commenced.

## Organization of the Book

The book is structured into five sections. The first section, Chapters One to Three, provides an overview of our project, why value chains are important to study but underappreciated, and how the health care value chain works. A reading of Chapter Three will convey some of the enormous complexity of the health care industry in a rather mundane area such as product procurement and delivery.

The second section, Chapters Four to Six, describes the two major intermediaries (purchasers) between producers and providers

Exhibit 1.6 Product and Supply Chain Role of Firms in Sample

Product	<i>Location in the Chain</i>		
	Manufacturer	Distributor	GPO
Drugs	Eli Lilly	Cardinal Health	Premier
	Merck	Bergen Brunswig	Novation
	Abbott		Tenet
	Big Pharma		
Med-Surg	3 M	Allegiance	Premier
	Baxter		Novation
	Big Med-Surg		Tenet
	B-D		
	Abbott		
Devices	Medtronic		
	Depuy		
	Zimmer		

Exhibit 1.7 Ranking of Sample Firms by 1998 Revenues\*

Firm	1998 Rev	Rank
Merck	\$ 26.9 B	1
Bergen Brunswig	\$ 13.7 B	7
Cardinal Health	\$ 12.9 B	12
Abbott Labs	\$ 12.5 B	13
Tenet	\$ 9.9 B	15
Eli Lilly	\$ 9.2 B	16
Big Med-Surg (anon)		Top 20
Big Pharma (anon)		Top 20
Baxter Int'l	\$ 6.6 B	22
Allegiance	\$ 4.6 B	23
Becton Dickinson	\$ 3.1 B	27
Medtronic	\$ 2.6 B	35

\*Excludes payers/HMOs

in the health care value chain: group purchasing organizations (GPOs) and distributors. GPOs buy products in bulk from producers on behalf of their hospital members, while distributors take title to the products and physically deliver them from producers to providers.

The third section, Chapters Seven to Nine, describes the perspectives and strategies of producers (manufacturers) in three product areas: pharmaceuticals, medical devices, and medical-surgical products. These chapters try to parse the different channel strategies taken by product firms and relate them to topics of interest to hospital providers, such as standardization and disease management.

The fourth section, Chapters Ten to Eleven, describes the role of e-commerce in linking up the value chain down to the provider level. Chapter Ten illustrates how e-commerce has developed in health care in the form of stand-alone dot-com firms and the technological solutions developed by GPOs, producers, and distributors. Chapter Eleven argues that all of these solutions may come to naught if providers are unwilling or unable to utilize them.

The fifth and final section represents an attempt to integrate material across the preceding chapters and draw some conclusions. Chapter Twelve discusses some of the facilitators and barriers to improved value chain operations in the health care industry, and some of the leitmotifs of the project. It also offers some forward thinking about the hospital customer of the future.

## Endnotes

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