



TITLE

VALUE CHAIN ANALYSIS FOR ASSESSING COMPETITIVE ADVANTAGE

CREDITS

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I. RATIONALE

Competitive advantage for a company means not just matching or surpassing what competitors can do, but discovering what customers want and then profitably satisfying, and even exceeding, their expectations. As barriers to interregional and international trade have diminished and as access to goods and services has grown, customers can locate and acquire the best of what they want, at an acceptable price, wherever it is in the world. Under growing competition and, hence, rising customer expectations, a company's penalty for complacency becomes even greater.

A strategic tool to measure the importance of the customer's perceived value is value chain analysis. By enabling companies to determine the strategic advantages and disadvantages of their activities and value-creating processes in the marketplace, value chain analysis becomes essential for assessing competitive advantage.

II. SCOPE

This guideline is addressed to managers, and more specifically to management accountants, who may lead efforts to implement value chain analysis in their organizations.

The concepts, tools and techniques presented apply to all organizations that produce and sell a product or provide a service.

This guideline will help readers to:

- link value chain analysis to organizational goals, strategies and objectives;
- broaden management awareness about value chain analysis;
- understand the value chain approach for assessing competitive advantage;
- comprehend useful strategic frameworks for value chain analysis; and

- appreciate the organizational and managerial accounting challenges.

III. THE VALUE CHAIN DEFINED

The idea of a value chain was first suggested by Michael Porter (1985) to depict how customer value accumulates along a chain of activities that lead to an end product or service.

Porter describes the value chain as the internal processes or activities a company performs “to design, produce, market, deliver and support its product.” He further states that “a firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach to implementing its strategy, and the underlying economics of the activities themselves.”

Porter describes two major categories of business activities: primary activities and support activities. Primary activities are directly involved in transforming inputs into outputs and in delivery and after-sales support. These are generally also the line activities of the organization. They include:

- *inbound logistics*—material handling and warehousing;
- *operations*—transforming inputs into the final product;
- *outbound logistics*—order processing and distribution;
- *marketing and sales*—communication, pricing and channel management; and
- *service*—installation, repair and parts.



Support activities support primary activities and other support activities. They are handled by the organization's staff functions and include:

- *procurement*—purchasing of raw materials, supplies and other consumable items as well as assets;
- *technology development*—know-how, procedures and technological inputs needed in every value chain activity;
- *human resource management*—selection, promotion and placement; appraisal; rewards; management development; and labor/employee relations; and
- *firm infrastructure*—general management, planning, finance, accounting, legal, government affairs and quality management.

John Shank and V. Govindarajan (1993) describe the value chain in broader terms than does Porter. They state that “the value chain for any firm is the value-creating activities all the way from basic raw material sources from component suppliers through to the ultimate end-use product delivered into the final consumers hands.” This description views the firm as part of an overall chain of value-creating processes.

According to Shank and Govindarajan, the industry value chain starts with the value-creating processes of suppliers, who provide the basic raw materials and components. It continues with the value-creating processes of different classes of buyers or end-use consumers, and culminates in the disposal and recycling of materials.

The industry value chain and the value chain activities within the firm are compared in Exhibit 1.

IV. COMPETITIVE ADVANTAGE AND CUSTOMER VALUE

In order to survive and prosper in an industry, firms must meet two criteria: they must supply what customers want to buy, and they must survive competition. A firm's overall competitive advantage derives from the difference between the value it offers to customers and its cost of creating that customer value.

Competitive advantage in regard to products and services takes two possible forms. The first is an *offering* or *differentiation advantage*. If customers perceive a product or service as superior, they become more willing to pay a premium price relative to the price they will pay for competing offerings. The second is a relative *low-cost advantage*, which customers gain when a company's total costs undercut those of its average competitor.

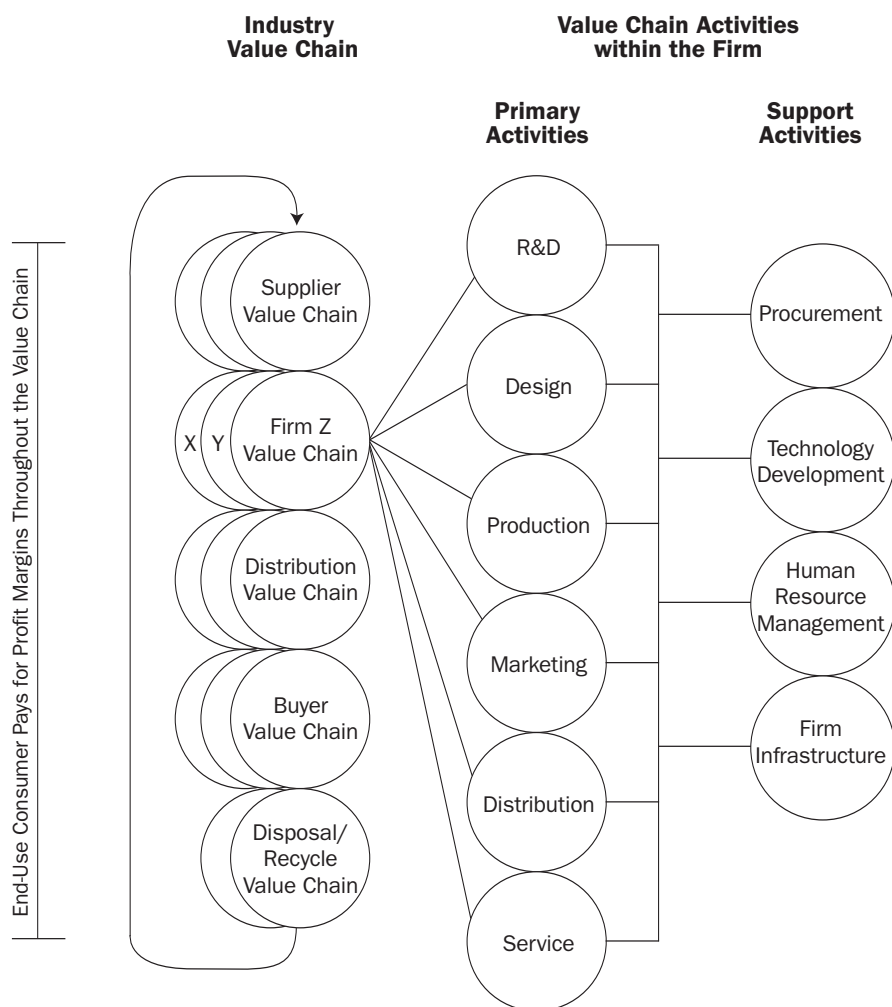
Differentiation Advantage

A differentiation advantage occurs when customers perceive that a business unit's product offering (defined to include all attributes relevant to the buying decision) is of higher quality, incurs fewer risks and/or outperforms competing product offerings. For example, differentiation may include a firm's ability to deliver goods and services in a timely manner, to produce better quality, to offer the customer a wider range of goods and services, and other factors that provide unique customer value.

Once a company has successfully differentiated its offering, management may exploit the advantage in one of two ways: increase price until it just offsets the improvement in customer benefits, thus maintaining current market share; or price below the “full premium” level in order to build market share.



EXHIBIT 1. THE VALUE CHAIN



Low-Cost Advantage

A firm enjoys a relative cost advantage if its total costs are lower than the market average. This relative cost advantage enables a business to do one of two things: price its product or service lower than its competitors in order to gain market share and still maintain current profitability; or match the price of competing products or services and increase its profitability.

Many sources of cost advantage exist: access to low-cost raw materials; innovative process technology; low-cost access to distribution channels or customers; and superior operating management. A company might also gain a relative cost advantage by exploiting economies of scale in some markets.

The relationship between low-cost advantage and differentiation advantage is illustrated in Exhibit 2.



EXHIBIT 2. COMPETITIVE ADVANTAGE THROUGH LOW COST AND/OR DIFFERENTIATION

Relative Differentiation Position	Superior	Differentiation Advantage	Differentiation with Cost Advantage
	Inferior	Stuck-in-the-Middle	Low-Cost Advantage
		Inferior	Superior

Source: Shank and Govindarajan, 1993.

Superior relative cost position offers equivalent customer value for a lower price. Superior relative differentiation position offers better customer value for an equivalent price.

Organizations that fail to gain competitive advantage through low cost or superior differentiation, or both, are “stuck-in-the-middle.” For instance, several American bicycle makers, including Schwinn, Huffy, Murray and Columbia, found themselves in this position during the 1980s. These companies lacked a cost advantage and failed to foresee the emerging mountain bike market. By contrast, Cannondale captured market share after introducing its large-diameter frame bicycle.

V. THE ROLE OF THE MANAGEMENT ACCOUNTANT

The management accountant is traditionally considered the resident expert on cost analysis; cost estimation; cost behavior; standard costing; profitability analysis by product, customer or

distribution channel; profit variance analysis; and financial analysis.

Today, management accountants must also bring skills in activity-based costing, benchmarking, re-engineering, target costing, life-cycle costing, economic value analysis, total quality management and value chain analysis. The Appendix contrasts traditional management accounting with the requirements of value chain analysis.

Value chain analysis is a team effort. Management accountants need to collaborate with engineering, production, marketing, distribution and service professionals to focus on the strengths, weaknesses, opportunities and threats identified in the value chain analysis results.

By championing the use of value chain analysis, the management accountant enhances the firm's value and demonstrates the value of the finance staff to the firm's growth and survival.



VI. THE VALUE CHAIN APPROACH FOR ASSESSING COMPETITIVE ADVANTAGE

Most corporations define their mission as one of creating products or services. For these organizations, the products or services generated are more important than any single step within their value chain. In contrast, other companies are acutely aware of the strategic importance of individual activities within their value chain. They thrive by concentrating on the particular activities that allow them to capture maximum value for their customers and themselves.

These firms use the value chain approach to better understand which segments, distribution channels, price points, product differentiation, selling propositions and value chain configurations will yield them the greatest competitive advantage.

The way that the value chain approach helps organizations assess competitive advantage is through the following types of analysis:

- *internal cost analysis*—to determine the sources of profitability and the relative cost positions of internal value-creating processes;
- *internal differentiation analysis*—to understand the sources of differentiation (including the cost) within internal value-creating processes; and
- *vertical linkage analysis*—to understand the relationships and associated costs among external suppliers and customers in order to maximize the value delivered to customers and to minimize cost.

These types of analysis are not mutually exclusive. Rather, firms begin by focusing on their internal operations and gradually widen their focus to consider their competitive position within their industry.

The value chain approach for assessing competitive advantage is an integral part of the strategic planning process. Like strategic planning, value chain analysis is a continuous process of gathering, evaluating and communicating information for business decision-making. By stimulating strategic thinking, the analysis helps managers envision the company's future and implement decisions to gain competitive advantage.

Internal Cost Analysis

Organizations use the value chain approach to identify sources of profitability and to understand the cost of their internal processes or activities. The principal steps of internal cost analysis are:

- identify the firm's value-creating processes;
- determine the portion of the total cost of the product or service attributable to each value-creating process;
- identify the cost drivers for each process;
- identify the links between processes; and
- evaluate the opportunities for achieving relative cost advantage.

Identify the firm's value-creating processes.

To identify its value-creating processes, a firm must de-emphasize its functional structure. Most large businesses still organize themselves as cost, revenue, profit and investment centres. These and other organizational sub-units, such as departments, functions, divisions or separate companies, that are frequently used for control purposes are not very useful for identifying value-creating processes. Adopting a process perspective requires a horizontal view of the organization, beginning with product inputs and ending with outputs and customers.



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Processes are structured and measured sets of activities designed to produce a specified output for a particular customer or market. Emphasizing process means focusing not on *what* work is done but on *how* work is done within the organization.

While an organization's hierarchical structure typically lays out responsibilities and reporting relationships, its process structure shows how the organization delivers customer value. While it is not possible to measure or improve hierarchical structure in any absolute sense, processes lend themselves to such measures as cost, time, output quality and customer satisfaction.

Because processes normally cut across functional areas, defining process boundaries is not always a straightforward task. People associated with a particular business process may view it in different ways. For example, the new product development process could start with marketing surveys or with delivery of product requirements from marketing to development engineering. The process could end with the release of product specifications or with shipment of the first order. Process boundaries should be defined independently of the way in which activities are organized.

Selecting the appropriate activity category may be anything but straightforward. The key is to classify value activities according to their true contribution to the firm's competitive advantage. For example, if order processing is important to a firm's customer interactions, then this activity should be classified under marketing.

Management at American Airlines, for example, handed its marketing unit the task of developing and implementing the carrier's SABRE computerized reservation system. The result: a significant competitive advantage that left the other airlines scrambling to copy the system. Even mighty

United Airlines has failed to match American's installed base of terminals in travel agencies.

Determine the portion of the total cost of the product or service attributable to each value-creating process.

The next step of internal cost analysis is to trace or assign costs and assets to each value-creating process identified. Although firms maintain internal reports and cost accounting information, this information may not align with their processes. Companies might have to reclassify their data or conduct cost studies to assign costs and assets to each process. Rather than conduct a detailed cost study, an organization might use rough estimates to assign costs to their value-creating processes.

A full-cost approach provides the best estimate of life-cycle costs for evaluating the strategic cost advantage of a firm's value-creating process. Without adopting this approach, a firm risks sacrificing product development costs to short-term profits.

For example, the savings in factory labor that an organization gains through using flexible manufacturing systems, robotics and computer-integrated manufacturing might be offset by the high cost of computer software programmers. The information systems support costs should be allocated to the value-creating processes that benefit from the new systems as part of the full cost.

For estimating the full cost of each value-creating activity, the full utilization of the capacity of the activity or its practical capacity is normally used. Facility managers and equipment vendors are useful sources of capacity estimates. If estimates of full capacity vary widely, a firm could perform the analysis with the resulting



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costs to assess the sensitivity of the analysis to the different capacity measures. When costs vary dramatically, companies should seek more information for a more realistic long-term estimate of capacity.¹

Although many of the processes identified may be instrumental for achieving competitive advantage, various value-creating processes may have differing effects on a firm's costs or products. Companies selling pencils, pens or paper clips, for example, are unlikely to concern themselves with after-sales service. But customer support is a vital part of the competitive strategy for makers of computers or high-speed copiers.

Identify the cost drivers for each process.

The next step of internal cost analysis is to identify the factor or cost determinants for each value-creating process. By understanding what factors drive costs, a firm can assign priorities among its cost improvement initiatives. In order to determine its relative cost advantage, a firm should also know the cost factors of its competitors.²

While management accounting systems may contain the total cost of each value-creating process, they may not reveal the causes or factors for the significant individual costs. Using single output or volume measures (e.g., units, labor hours, sales dollars) to assign costs is often misleading. Multiple cost drivers usually provide more useful information. Exhibit 3 illustrates examples of structural and executional cost drivers.

Structural cost drivers consist of organizational factors that determine the economic structure driving the cost of a firm's products. These cost drivers reflect a firm's long-term decisions, which position the firm in its industry and marketplace. Structural cost drivers may change.

For example, large pharmaceutical companies enjoy economies of scale that lower their unit costs for expensive R&D. Elsewhere, Texas Instruments has exploited the experience curve in lowering its life-cycle product cost. However, bigger is not necessarily better, as evidenced by the success of steel companies' mini-mill strategy.

Executional cost drivers capture a firm's operational decisions on how best to employ its resources to achieve its goals and objectives. These cost drivers are determined by management policy, style and culture. How well a firm executes its use of human and physical resources will determine its level of success or failure. For example, worker empowerment and flattened organizations are helping many firms in their continuous improvement efforts.

Few structural and executional cost drivers can be operationalized under existing management accounting systems in the cost analysis of the value chain. However, these cost drivers do offer an important reminder of the strategic decisions that firms need to make, or at least acknowledge, in designing their value-generating systems. Increasingly, companies are using activity-based costing to understand the resources/costs consumed by the activities and processes used in delivering their products and services.

1 The reader should refer to IMA's Statement on Management Accounting, "Measuring the Cost of Capacity," for additional information regarding the various approaches used for measuring capacity.

2. The reader should refer to IMA's Statement on Management Accounting, "Developing Comprehensive Competitive Intelligence," for additional information regarding the acquisition of competitive cost information.



EXHIBIT 3. PROCESS COST DRIVERS

STRUCTURAL COST DRIVERS

Scale	How big an investment to make in manufacturing, R&D, marketing and other resources?
Scope	What is the degree of vertical integration— horizontal integration is more related to scale?
Experience or learning	How often has the firm already done this?
Technology	What process technologies are used within each step of the firm's value chain?
Complexity	How wide a line of products or services to offer to customers?

EXECUTIONAL COST DRIVERS

Workforce involvement or participation	Is the workforce involved in decisions and improvements in performance?
Total quality management	Are the workforce and managers committed to total quality in processes and products?
Capacity utilization	What are the scale choices on maximum plant construction?
Plant layout efficiency	How efficient, against current norms, is the plant's layout?
Product configuration	Is the design or formulation of the product effective?
Linkages with suppliers and customers	Is the linkage with suppliers and customers exploited, according to the firm's value chain?

Source: Riley, 1987.



Identify the links among processes.

While individual value activities are considered separate and discrete, they are not necessarily independent. Most activities within a value chain are interdependent. Firms must not overlook value chain linkages among interdependent activities that may impact their total cost.

For example, cost improvement programs in one value chain process may lower or increase costs and/or revenues in other processes. Transfers of goods and services from one value chain process to another increases cost. Eliminating these transfers reduces the costs of purchasing, invoicing and other recordkeeping functions.

Tandem Computers eliminated its costs of purchase orders, invoicing and other functions by jointly developing a detailed bar code process with its suppliers. By improving its upstream design and engineering processes for the Taurus, Ford saved on downstream production and customer service costs. Using fewer floppy drives and motherboards in its PCs has enabled IBM to halve its delivered cost in two years.

As sources of competitive advantage, these relationships or linkages among activities can be as important as the activities themselves. Such linkages may also offer sustainable competitive advantage, because their subtle, complex nature makes them difficult for competitors to imitate.

Evaluate the opportunities for achieving relative cost advantage.

In many organizations, cost reductions are made across the board (e.g., “eliminate 10 per cent from every department”). Because these firms do not reduce their costs strategically, this effort usually fails. More often than not, across-the-board cost reduction misconstrues the underlying problem. The point is not to become more

efficient at insignificant activities, but to better meet customer demands.

Using the value chain approach, a company goes beyond simple across-the-board cuts and attempts to lower cost and improve efficiency within each value-creating process. For instance, a company might negotiate lower costs of process inputs such as wages or purchases, or evaluate make-or-buy options.

Reducing process input costs often means negotiating lower wages (as with Chrysler and the U.S. airlines during the mid-1980s) or moving production to countries with cheaper labor costs. Suppliers might be willing to drop their prices if the company negotiates long-term contracts, an approach used by Levi-Strauss in contracting with its textile suppliers. Companies also use buyer-seller partnerships to gain advantages in cost, quality, time, flexibility, delivery and technology.³

United Parcel Service (UPS) outsourced its customer service centers. In the process, the company consolidated 65 customer service centers representing 5,000 jobs down to between eight and 10 service centers run by contractors. UPS service center employees earn \$10 to \$12 an hour versus the \$6.50 to \$8 an hour paid to contractors.

Some processes may offer more opportunities for improvement than others. In order to get the most out of its cost reduction programs, a company should prioritize its value-creating processes. Under the 80:20 rule, 20 per cent of the value-creating processes often accounts for 80 per cent of total costs.

³ For more information on buyer-seller partnerships, the reader should refer to The Society of Management Accountants of Canada’s Management Accounting Guideline #32, “Building Buyer-Seller Partnerships.”



EXHIBIT 4. COMPETITOR COST ANALYSIS

Independent Auto Repair	Specialty Brake Repair	Cost Drivers	Cost Reduction
100%	79%		21%
Material	Material	Purchasing scale More efficient distribution	9%
Labor	Labor	Less-skilled labor Lower compensation More specialization & productivity	7%
Variable Shop and SG&A	Variable Shop and SG&A	Scale offset by larger advertising expenses	0%
Fixed Shop and SG&A	Fixed Shop and SG&A	Higher utilization of equipment & facilities	5%

An example of the value chain approach to achieving a relative cost advantage is illustrated in Exhibit 4. This exhibit compares a specialty brake repair firm with an independent auto repair firm. By focusing on cost drivers such as scale, skill levels, wages and capacity utilization, the specialty brake shop was able to reduce its costs by 21 per cent. Its largest percentage cost reduction was in material cost.

Companies can use comparisons with best practices, benchmarking and business process redesign to reduce their costs. The cost of quality emphasizes that eliminating process and material waste leads to significant cost savings and customer satisfaction.

Internal Differentiation Analysis

The value chain approach is also used by organizations to identify opportunities for creating and sustaining superior differentiation. In this situation, the primary focus is on the customer's perceived value of the products and services.

As with internal cost analysis, internal differentiation analysis requires firms to first identify their value-creating processes and primary cost drivers. They are then ready to perform a differentiation analysis using the following guidelines:

- identify the customers' value-creating processes;
- evaluate differentiation strategies for enhancing customer value; and
- determine the best sustainable differentiation strategies.



Identify the customers' value-creating processes.

To pursue a superior differentiation strategy, a firm's processes must enhance those of its customers. Thus, a firm should carefully study the value-creating processes of its customers. Exhibit 5 presents such an analysis for Crown, Cork and Seal Company (CCS), a metal can maker, and its customers in the late 1970s. The metal container industry was characterized by low growth, low profits and intense competition. CCS succeeded with a differentiation strategy, which is usually very difficult to accomplish in a commodity-type business. Two different groups of customers—food and beverage canners—accounted for 80 per cent of the metal containers produced.

Evaluate differentiation strategies for enhancing customer value.

The key to successful differentiation under the value-chain approach is to identify the value-creating processes that distinguish a firm's products or services from those of its competitors. In making this distinction, customer value is emphasized.

The ways customer value can be enhanced through differentiation include:

- *product features*—that are esthetically appealing or functionally superior. For example, the Mercedes-Benz automobile accomplished this feat so well for years that its name became synonymous with the highest level of quality—people would describe a product as the “Mercedes-Benz” of its category;
- *marketing channels*—that provide desired levels of responsiveness, convenience, variety and information. By placing its order-entry computers in Wal-Mart's stores, Procter & Gamble significantly reduced the overall order-entry and processing costs for both firms. Providing

this unique service to a customer also enabled P&G to improve its on-time delivery of ordered merchandise;

- *service and support*—tailored to end-user and channel member sophistication and urgency of need. For several decades, superior service capabilities and high vendor switching costs produced by proprietary architecture and software enabled IBM to build and maintain a commanding leadership position in the mainframe computer industry. Until open systems appeared in the mid-1980s, risk-averse customers were reluctant to make large capital and conversion outlays for mainframe computer systems without the manufacturer's strong assurance of reliability;
- *brand or image positioning*—that lends greater appeal to the company's offerings on critical selection criteria. For many years, this quality image has allowed the American Express Co. to command a significant price premium in the highly competitive financial services market—a premium that reflects, in its words, the “privilege of membership”; and
- *price*—including both net purchase price and cost savings available to the customer through the use of the product and service.

Determine the best sustainable differentiation strategies.

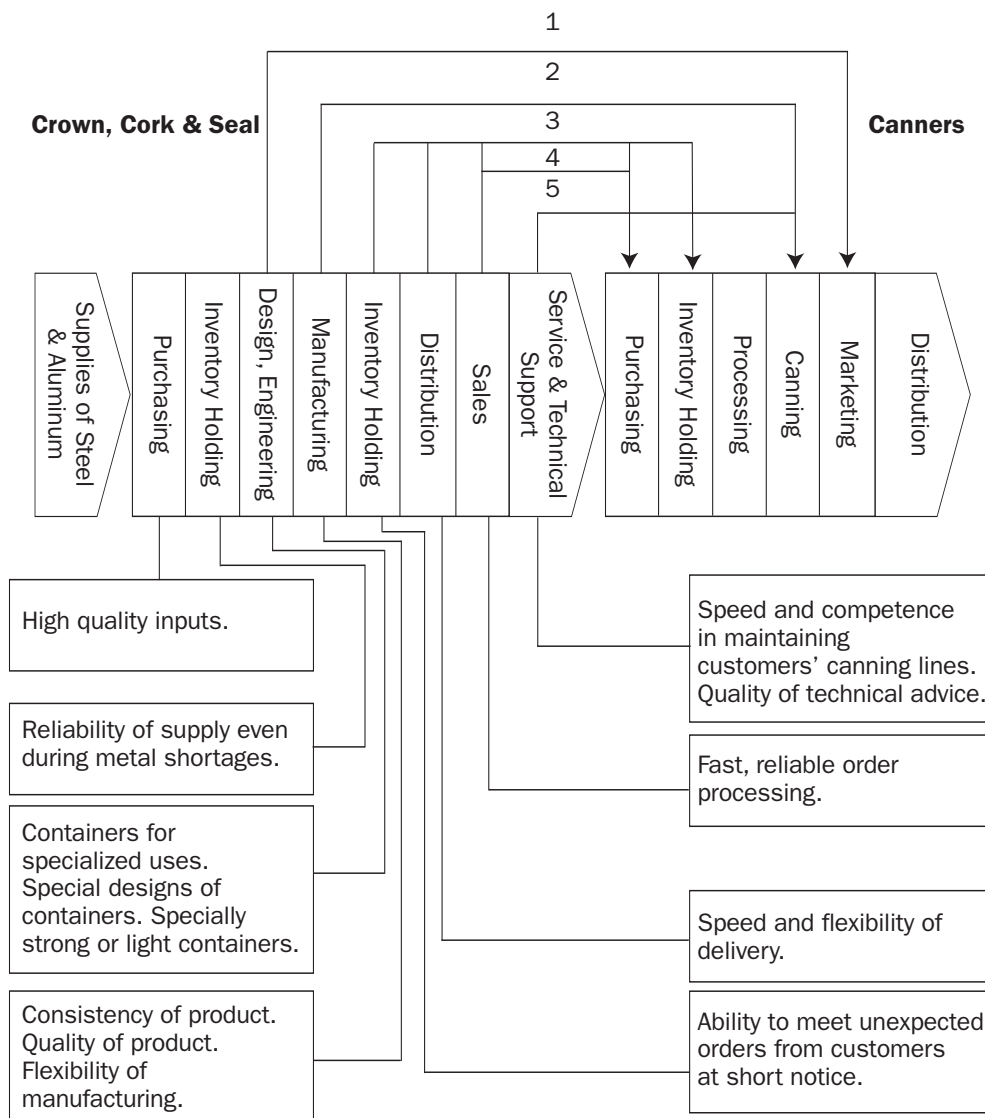
For a firm to achieve superior differentiation, it must utilize the best mix of resources in creating value for its customers. In order to prioritize its processes as sources of differentiation, a company must determine what attributes of each process enhance customer value.

The more unique a firm's resources and skills, the more sustainable is its differentiation advantage over competitors.



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EXHIBIT 5. VALUE CHAIN FOR CROWN, CORK AND SEAL COMPANY



1. Designing distinctive cans for customers may assist their own marketing activities.
2. Consistent can quality lowers customers' canning costs by avoiding breakdowns and holdups on their canning lines.
3. By maintaining high stocks and offering speedy delivery, customers can economize on their own stockholding (they may even be able to move to a just-in-time system of can supply).
4. Efficient order processing can reduce customers' ordering costs.
5. Capable and fast technical support can reduce the costs of breakdowns on canning lines.

Adapted from: "Crown, Cork and Seal Company and the Metal Container Industry," and
"Crown, Cork and Seal Company, Inc." Harvard Business School, 1978.



CCS (Exhibit 5), for example, focused only on tin-plated steel can production, not aluminum; produced for beverage and aerosol customers, not food processors; and invested in more can-forming lines at its plants to reduce changeovers and set-up wages. CCS was also willing to devote more resources to customizing metal containers for customers and to increase its responsiveness to customers' schedule and quality needs.

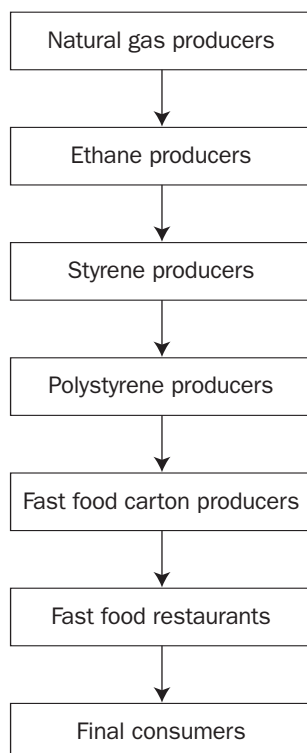
The payoffs for effective differentiation, and the penalties for not differentiating, are clear. In 1980, Purolator Courier was bigger than Federal Express; today the reverse is true. In 1982, Dreyfus had more assets under management than Fidelity—a situation that had reversed itself by the mid-90s.

Vertical Linkage Analysis

Linkages among value-creating processes do not end with the activities within a firm. The greatest competitive advantage may come out of linkages between a firm's value-creating activities and those of its suppliers, channels or users.

Vertical linkage analysis is a much broader application of internal cost and differentiation analysis that includes all upstream and downstream value-creating processes throughout the industry. Vertical linkage analysis considers *all* links from the source of raw materials to the disposal and/or recycling of the product. Exhibit 6 outlines the vertical links involved in the production of "fast food" containers.

EXHIBIT 6. VERTICAL LINKAGES IN THE PRODUCTION OF PLASTIC FOOD CONTAINERS





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Shank and Govindarajan (1993) state the importance of vertical linkages:

...gaining and sustaining a competitive advantage requires that a firm understand the entire value delivery system, not just the portion of the value chain in which it participates. Suppliers and customers and suppliers' suppliers and customers' customers have profit margins that are important to identify in understanding a firm's cost/differentiation positioning, because the end-use customers ultimately pay for all the profit margins along the entire value chain.

Vertical linkage can reveal which activities are the most (and least) critical to competitive advantage (or disadvantage). For example, Swiss watchmakers succeeded for years as relatively small, labor-intensive assemblers. Then came the 1970s and the advent of low-cost, mass-produced watches. The Swiss responded by restructuring their industry to gain economies of scale similar to those enjoyed by their new global competitors.

However, the Swiss failed to realize that their critical problem was not in manufacturing. This set of activities added only a small proportion of the value of their final product. Far more significant were downstream activities in output logistics, marketing, sales and service. Beyond being able to make a watch cheaply, the Swiss had to lower their costs of distribution and service. They came up with the hugely successful Swatch, which, besides being inexpensively priced, was virtually indestructible and could be distributed through numerous low-cost channels, from department stores to discount houses.

Vertical linkage analysis includes the following steps:

- identify the industry's value chain and assign costs, revenues and assets to value-creating processes;
- diagnose the cost drivers for each value-creating process; and
- evaluate the opportunities for sustainable competitive advantage.

Identify the industry's value chain and assign costs, revenues and assets to value-creating processes.

Because vertical linkages can be complex and intangible, they are often overlooked by organizations. For example, the petroleum industry consists of numerous value-creating processes or activities, including exploration, production, refining, marketing and distribution. These processes define the value chain for this industry. One company may participate in all parts of this value chain; another firm may participate in only a few. This diversity of operations and organizations makes it difficult to adopt a standard approach for identifying industry value chain processes.

Few firms have information systems that can identify and analyze these subtle relationships. For example, profitability and return on assets are key measures of competitive advantage throughout an industry's value chain. It can be extremely difficult to obtain pertinent information for these measures, including operating costs, revenues and assets for each process throughout the industry's value chain. However, this information is necessary to calculate a rate of return on assets for each value chain process.

Obtaining the replacement or current cost of physical assets used by a value-creating activity



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is a necessary but often-complex undertaking. Historical or book values usually provide inadequate measures of current investment. Plant engineers, equipment vendors and independent appraisal professionals may be consulted to help establish current asset values. Likewise, establishing prices for transferring goods and services among value chain processes requires an understanding of market or competitive-based rates. If at least one firm competes in each stage of value creation, then competitive market prices are available. If not, then a company must use judgment in determining a transfer price that incorporates a normal profit margin on full costs. For long-term strategic decision-making, companies should use full cost under conditions of full capacity for the value activity. While several measures of capacity exist, the best measure should represent the long-term utilization of the value activity's assets (sometimes called "practical capacity").

Publicly available financial reports produced by firms throughout the industry value chain can provide key financial information. Typically, this information is neither in the proper format nor disaggregated enough to accommodate vertical linkage analysis. Significant analysis, data manipulation and judgment may be necessary to obtain the appropriate information for each value chain process.

For intermediate transfers between processes, competitive market prices, if available, should be substituted for the internal transfer prices. For example, competitive market prices for a single link in the value chain may be obtained from individual firms that operate only in that link of the chain. For long-term cost estimation, full costs should be used rather than marginal, variable or incremental costs.

Diagnose the cost drivers for each value-creating process.

Traditional management or cost accounting systems often assign costs by using a single output measure of operating activity, such as output volume. For vertical linkage analysis, a single measure is inadequate to capture the underlying cost categories. Direct labor-based measures may be appropriate for labor-intensive activities; operating hours may be appropriate for machine-based activities. The cost drivers illustrated in Exhibit 3 may be used to identify the factors that determine costs throughout the industry value chain.

Evaluate the opportunities for sustainable competitive advantage.

By nature, competitive advantage is relative. In an ideal world, a firm can gauge its competitive position by knowing its competitor's value chains and the rates of return on each. In reality, however, this may be rather difficult: the competitor's internal cost, revenue and asset data for its processes are generally unavailable. Sufficient qualitative information usually exists on a firm's major value-creating processes and the strategies for each. By understanding how other companies compete in each process of the industry value chain, a firm can use the qualitative analysis to seek out competitive niches even if financial data are unavailable.

Value chains for three competitors in the rapidly changing telecommunications industry—AT&T, NYNEX and IBM—are listed in Exhibit 7, along with the strategic differences for each firm (Hax and Majiuf, 1991). The strategic differences reflect varying structural and executional cost drivers. In marketing, for instance, AT&T started with no organization but with significant name recognition. The regional marketing scale of NYNEX and the worldwide marketing scale of IBM are important cost advantages.



EXHIBIT 7. VALUE CHAIN DIFFERENCES:
THE TELECOMMUNICATIONS INDUSTRY

Value Chain Processes	Strategic Differences		
	AT&T	NYNEX	IBM
Procurement	Owns manufacturing branch (Western Electric)	Free to use any supplier it wants	Owns Rolm, CPE manufacturer
Technology Development	Technological leadership through Bell Labs	Focus on software products	Strong R&D in computer hardware and software technologies
Operations	National presence High quality of equipment through heavy capital expenditure Similar communications standards nationwide Strongest national telecommunications network	Regional monopoly Innovative equipment from outside suppliers High-quality regional network through heavy capital investment	Global presence Leading computer technology Partnership with MCI
Marketing and Sales	New emphasis on marketing (still weak) High name recognition Long-term relationship with clients Recruits computer executives	Use of Bell logo Focus on top 1,000 corporate customers Sales and distribution centres close to customers	Strong reputation for marketing excellence Already sells to most major corporations Experienced sales force

Source: Hax and Majluf, 1991.

Finding innovative ways to perform value-creating activities helps firms improve their overall performance and achieve competitive advantage. In order to thrive in the mature, highly competitive meat packing industry, for example, Iowa Beef Processors built its plants near cattle ranches, thus eliminating the high cost of shipping cattle to northern processing plants. In order to lower its costs, Tropicana froze slabs of orange juice concentrate near the orange groves in Florida

and shipped the slabs to its large markets in the Northeastern U.S. Only then did the company mix the concentrate with water, thus avoiding the lengthy and costly shipment of water.

Increased global competition forces firms to focus on *worldwide* sustainable competitive advantage. Porter (1990), one of a few strategists who have systematically studied global competition, cites four major factors that influence national competitive



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advantage. These are:

- *factor conditions*—the nation's position in factors of production, such as skilled labor or infrastructure, necessary to compete in a given industry;
- *demand conditions*—the nature of domestic demand for the industry's product or service;
- *related and supporting industries*—the presence or absence in the nation of supplier industries and related industries that are internationally competitive; and
- *firm strategy, structure and rivalry*—the conditions in the nation governing how companies are created, organized and managed, and the nature of domestic rivalry.

Geographic scope can allow firms to gain substantial competitive advantages by sharing or coordinating similar value activities in different places. The importance of this advantage is illustrated by the recent success of firms with a global scope, such as Canon (Japan), Caterpillar (U.S.), N.Y. Philips (Netherlands) and Siemens (West Germany). These firms sell and service their products in practically every corner of the globe.

Automakers like Ford or GM are even more global: they carry out many key value-creating activities—from engineering to manufacturing and sales—in dozens of countries around the world. Japanese auto companies are also globalizing rapidly, making huge investments in manufacturing facilities in, for example, South Korea, Singapore and the U.S.

Nike's key value-creating processes are shoe design, manufacture of shoe components and final assembly. All major inputs to each process are available in the U.S. However, Nike locates component manufacturing, requiring moderately skilled labor and capital, in Taiwan and South Korea. It locates assembly operations, a labor-

intensive activity, in low-wage Asian countries such as China, Thailand and the Philippines.

Taking a global view of the value chain is not without disadvantages. One possible negative factor is transportation between linked processes. Transportation consumes time and adds to costs. Shipments of electronic components between the Far East and North American assembly plants may take at least a month. Transporting components to local assembly plants may save transport and inventory costs.

Scattering value-creating processes around the world can also lead to poor control, communication and coordination. Close proximity of R&D, engineering, production and marketing personnel may provide synergistic benefits in meeting customer needs.

For example, to increase its worldwide tire production capacity to compete with Michelin, Japan's Bridgestone acquired Firestone Tire & Rubber in the U.S. Muddled strategies, slow decision-making and poor communication between Tokyo and Akron, Ohio, led to major losses, layoffs and a sell-off of assets.

The North American Free Trade Agreement among Canada, Mexico and the U.S. has introduced new relationships affecting value-chain analysis for suppliers and buyers alike. These relationships require careful scrutiny. For example, lower labor costs in Mexico have motivated companies to locate their assembly and manufacturing processes there. However, some firms have experienced costly productivity and quality problems that more than offset their labor savings. Each firm must balance the benefits/cost of a multi-location decision.



To properly evaluate the opportunities for competitive advantage in the global marketplace, firms need to consider such things as a country's values, political climate, environmental concerns, trade relations, tax laws, inflation rates and currency fluctuations. The recent devaluation of the Mexican peso is an example of the risks of moving operations to uncertain economies.

VII. STRATEGIC FRAMEWORKS FOR VALUE CHAIN ANALYSIS

Value chain analysis requires a strategic framework or focus for organizing internal and external information, for analyzing information, and for summarizing findings and recommendations. Because value chain analysis is still evolving, no uniform practices have yet been established. However, borrowing recent concepts from strategists and organization experts, three useful strategic frameworks for value chain analysis are:

- industry structure analysis;
- core competencies; and
- segmentation analysis.

Industry Structure Analysis

Michael Porter (1980, 1985) developed the five forces model as a way to organize information about an industry structure to evaluate its potential attractiveness.

Under this model, the profitability of an industry or market measured by the long-term return on investment of the average firm depends largely on five factors that influence profitability. These are:

- bargaining power of buyers;
- bargaining power of suppliers;
- threat of substitute products or services;
- threat of new entrants; and
- intensity of competition.

Bargaining power of buyers

The degree of buyer power generally depends on:

- customer concentration (the higher the concentration of customers, the greater their negotiating leverage);
- the propensity for customers to integrate backward (the higher the propensity for backward integration, the greater the bargaining leverage);
- costs of switching suppliers (the lower the switching costs, the greater the buyer's leverage); and
- the number of alternative suppliers (the greater the number, the greater the customer's leverage).

Bargaining power of suppliers

Just as powerful buyers can squeeze profits by putting downward pressure on prices, suppliers squeeze profits by increasing input costs. The same factors that determine the power of buyers also determine the power of suppliers. The bargaining power of suppliers and buyers relative to the firm depends on the relationships between their value chains. Bargaining power will be a function of relative strengths, in particular, value activities that depend on one another.

Identifying the specific activities involved and the nature of their strengths and relationships can give important insights into the power balance between buyer and seller, and how it may be altered for the firm's benefit.

Threat of substitute products or services

The potential for profit in an industry is determined by the maximum price that customers are willing to pay. This depends primarily on the availability of substitutes. When few substitutes exist for a product—e.g., gasoline—consumers are willing to pay a potentially high price. If close substitutes for a product exist, then there is a limit to what price customers are willing to pay.



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Any price increase will then cause some customers to switch to substitutes. A thorough understanding of the value chains of buyers as they relate to the firm's product can help in assessing (and combating) the threat of substitution.

Threat of new entrants

If an industry is earning a return on invested capital above the cost of capital, that industry will act as a magnet to firms outside the industry. Unless the entry of new firms is barred, the rate of profit must fall to the competitive level. Even the mere threat of entry may be sufficient to ensure that established firms constrain their prices to the competitive level.

Intensity of competition

Markets experiencing rapid growth typically see less intense competition. Rival companies can usually satisfy profitability and growth without having to take market shares from their competitors.

The variety and nature of the value chains of competitors shape many of the characteristics of an industry. The relative importance of economies of scale versus economies of scope, for example, depends on the kind(s) of technology employed in competitors' value chains. The stability of the industry and of its competitive situation also relates to what happens to the value chains of firms in the industry. The effectiveness of low cost versus differentiation strategies depends on the nature of users' value chains, and on how competitors' value chains interact with those of both sellers and users.

Since these five forces are ever-changing, Porter's framework needs to be employed as a *dynamic* analytical tool. This is because competition is a dynamic process: equilibrium is never reached and industry structures are constantly being reformed.

A major difficulty in industry structure analysis lies in defining the specific industry. No industry has clear boundaries either in terms of products or geographical areas. For example, does one analyze the industry environment of Ford as the "transportation equipment" industry, the "motor vehicles and equipment" industry or the "automobile" industry?

To overcome the difficulty of defining an industry, the concept of *substitutability* can be applied to a firm's supply and demand chains. On the demand side, if buyers are willing to substitute one product for another—e.g., Toyotas for Fords—then the manufacturers belong in a single industry. However, this guideline does not always hold. For example, customers may be unwilling to substitute Apple Macintosh computers for Compaq computers, even though both manufacturers belong to the same industry. On the supply side, if two manufacturers can make each other's products, then they belong to a single industry.

Porter's model sometimes draws criticism for neglecting the difficulty of obtaining and maintaining the information required to perform an industry structure analysis. While such an exercise may be time-consuming, it is essential to obtain a detailed database in order to fully understand an organization's competitive environment. Dismissing the task as too difficult is tempting, and may lead to inappropriate decision-making.

Core Competencies Analysis

Industry structure analysis is well suited to describing the *what* of competitiveness, i.e., what makes one firm or one industry more profitable than another. But understanding the particulars of such advantages as low cost, quality, customer service and time to market may still leave the



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question of *why* largely unanswered. For example, why do some companies seem able to continually create new forms of competitive advantage while others seem able only to observe and follow? Why are some firms net advantage creators and others net advantage imitators? For assessing competitive advantage it is necessary not only to keep score of existing advantages—what they are and who has them—but also to discover what it is that drives the process of advantage creation. Industry structure analysis is much better suited to the first task than to the second.

Thus, industry structure analysis must be supplemented by an equally explicit core competence focus. Organizations need to be viewed not only as a portfolio of products or services, but also as a portfolio of core competencies.

Core competencies are created by superior integration of technological, physical and human resources. They represent distinctive skills as well as intangible, invisible, intellectual assets and cultural capabilities. Cultural capabilities refer to the ability to manage change, the ability to learn and teamworking. Organizations should be viewed as a bundle of a few core competencies, each supported by several individual skills.

Core competencies are the connective tissue that holds together a portfolio of seemingly diverse businesses. They are the *lingua franca* that allows managers to translate insights and experience from one business setting into another. Core competence-based diversification reduces risk and investment and increases the opportunities for transferring learning and best practice across business units.

For instance, the New York Times stated that Microsoft's only factory asset is the human imagination. This company has excelled in inventing

new ways of using information technology for a wide variety of end users. In contrast, using its core competence in information processing, Xerox developed icons, pull-down menus and the computer mouse, but failed to exploit the marketplace.

A core competence is identified by the following tests:

- *Can it be leveraged?*—does it provide potential access to a wide variety of markets?
- *Does it enhance customer value?*—does it make a significant contribution to the perceived customer benefits of the end product?
- *Can it be imitated?*—does it reduce the threat of imitation by competitors?

Applying the value chain approach to core competencies for competitive advantage includes the following steps:

- validate core competencies in current businesses;
- export or leverage core competencies to the value chains of other existing businesses;
- use core competencies to reconfigure the value chains of existing businesses; and
- use core competencies to create new value chains.

Validate core competencies in current businesses.

Core competencies should tie together the portfolio of end products and help a firm excel in dominating its industry. For example, Corning Glass's core competence is its ability to melt specialty glass. Pyrex, television bulbs, headlamps and optical wave guides are just a few of the products of this successful producer. Procter & Gamble's R&D expertise and marketing/distribution skills provide a significant competitive advantage in a wide range of mass consumer products (e.g., Ivory, Tide, Folgers, Crisco, Pampers).



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Core competencies need to be continually validated. In the early 1970s, Timex held half of the global market for watches with its core competence in low-cost management of precision manufacturing. By the mid-1970s, the watch industry moved to digital technology, making Timex's core competence irrelevant.

Export or leverage competencies to the value chains of other existing businesses.

The same set of core competencies can be exploited in multiple businesses by exporting core competencies to the value chains of other existing businesses.

For example, one of Honda's core competencies is designing and producing small engines. By exporting this core competence to a wide variety of business lines, the company seeks to have six Hondas in every garage: autos, motorcycles, snowmobiles, lawnmowers, snow blowers, chain saws and power tools. Other Honda core competencies are dealership management and shorter product development cycles.

Marriott Corp. has core competencies in food service and hospitality skills, standardized hotel operating procedures, and a shared procurement

and distribution system. Besides employing these core competencies in hotels, the company uses them in its other businesses, including institutional food service, consumer food and restaurants, cruise ships and theme parks.

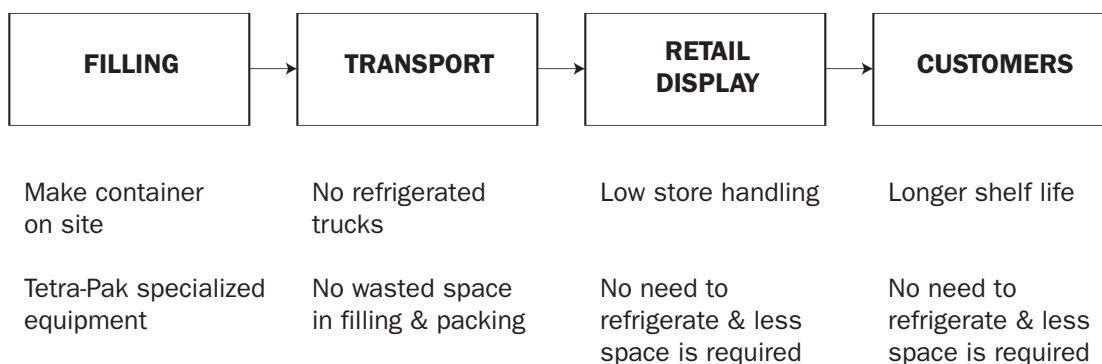
AT&T extended its core competence as an efficient processor of customer accounts by entering the credit card business. Kimberly Clark's entry into disposable diapers extended its core competence in the design of paper products.

Use core competencies to reconfigure the value chains of existing businesses.

While firms may manage their existing value chains better than their competitors, sophisticated firms work harder on using their core competencies to reconfigure the value chain to improve payoffs. Otherwise, competitors may exploit opportunities.

For example, Japanese watchmakers side-stepped traditional distribution channels in favor of mass merchandisers such as department store chains. By efficiently consolidating freight, Emery Freight dominated the air freight industry and was consistently a leader in profitability in U.S. industry. Federal Express reconfigured the

EXHIBIT 8. HOW TETRA-PAK RECONFIGURED THE VALUE CHAIN





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air freight business by focusing on the overnight delivery of small packages.

Tetra-Pak is an excellent example of a firm that reconfigured the value chain in the packaging industry for dairy products and orange juice. Tetra-Pak designed a filling machine for its a septic packages and changed the packaging industry. Exhibit 8 illustrates Tetra-Pak's changes to the value chain.

Another example of a value chain reconfiguration is IKEA, which grew from a small, Swedish mail-order furniture operation to one of the world's largest retailers of home furnishings (Normann & Ramirez, 1993). As illustrated in Exhibit 9, IKEA selected numerous factors to offer prices that are 25-50 per cent lower than those of competitors.

Use core competencies to create new value chains.

With strong core competencies in its existing businesses, an organization can seek new customers by developing new value chains.

For example, Federal Express (FedEx) transferred its expertise in the delivery of small packages to contract new business with L.L. Bean for overnight distribution. Disney has exported its people-moving skills to urban mass transit for Oakland, California.

The development of the corporate purchasing card is exporting the expertise of credit card companies, such as American Express and Visa, to process small purchase transactions for other companies.

EXHIBIT 9. HOW IKEA RECONFIGURED THE FURNITURE INDUSTRY

Value Chain	Major Choice
Design	Simple, high quality, designed to lower cost
Parts	Standard & common, global supplier network
Assembly	By the customer
Transport/stocking	Computerized system for suppliers & warehouses
Marketing	Scandinavian image
Display	Focus on designs, not pieces, to create value
Home delivery	By the customer

Source: Normann and Ramirez, 1993.



In a recent agreement, Roadway Logistics Systems, a unit of Roadway Services Inc., will manage and track all inbound and outbound shipments for Dell Computer Corp., including operations in Europe and Asia. The logistics company will also handle transportation for service and repair needs.

Segmentation Analysis

Industries are sometimes collections of different market segments. Vertically integrated industries are good examples of a string of natural businesses from the source of raw material to the end use by the final consumer. Several firms in the paper and steel industries are vertically integrated. Not all firms in an industry participate in all segments.

If the nature and intensity of Porter's five forces or the core competencies vary for various segments of an industry, then the structural characteristics of different industry segments need to be examined. This analysis will reveal the competitive advantages or disadvantages of different segments. A firm may use this information to decide to exit the segment, to enter a segment, reconfigure one or more segments, or embark on cost reduction/differentiation programs.

Differences in structure and competition among segments may also mean differences in key success factors among segments.

Using the value chain approach for segmentation analysis, Grant (1991) recommends five steps:

- identify segmentation variables and categories;
- construct a segmentation matrix;
- analyze segment attractiveness;
- identify key success factors for each segment; and
- analyze attractiveness of broad versus narrow segment scope.

Identify segmentation variables and categories.

There may be literally millions of ways to divide up the market into segments. Typically, an analysis considers between 5 to 10 segmentation variables. These variables are evaluated on the basis of their ability to identify segments for which different competitive strategies are (or should be) pursued.

The selection of the most useful segment-defining variables is rarely obvious. Industries may be subdivided by product lines, type of customer, channels of distribution and region/geography. The most common segmentation variables considered are *type of customer* and *product related*, as illustrated in Exhibit 10.

The first set of variables describes segments in terms of general characteristics unrelated to the product involved. Thus, a bakery might be concerned with geographic segments, focusing on one or more regions or even neighborhoods. It might also divide its market into organizational types such as at-home customers, restaurants, dining operations in schools, hospitals and so on. Demographics can define segments representing strategic opportunities such as single parents, professional women and elderly people.

The second category of segment variables includes those that are related to the product. One of the most frequently employed is usage. A bakery may employ a very different strategy in serving restaurants that are heavy users of bakery products than restaurants that use fewer bakery products. Zenith made a niche for itself in the very competitive personal computer industry by focusing on government, which is the largest computer user.

Segmenting by competitor is useful because it frequently leads to a well-defined strategy and a



EXHIBIT 10. APPROACHES TO DEFINING SEGMENTATION VARIABLES

Customer Characteristics

Geographic	– Small communities as markets for discount stores
Type of organization	– Computer needs of restaurants versus manufacturing firms versus banks versus retailers
Size of firm	– Large hospital versus medium versus small
Lifestyle	– Jaguar buyers tend to be more adventurous, less conservative than buyers of Mercedes-Benz and BMW
Sex	– The Virginia Slims cigarettes for women
Age	– Cereals for children versus adults
Occupation	– The paper copier needs of lawyers versus bankers versus dentists

Product-related Approaches

User type	– Appliance buyer - home builder, remodeler, homeowner
Usage	– The heavy potato user - the fast-food outlets
Benefits sought	– Dessert eaters - those who are calorie-conscious versus those who are more concerned with convenience
Price sensitivity	– Price-sensitive Honda Civic buyer versus the luxury Mercedes-Benz buyer
Competitor	– Those computer users now committed to IBM
Application	– Professional users of chain saws versus the homeowner
Brand loyalty	– Those committed to IBM versus others

strong positioning statement. Thus, a target customer group for the Toyota Cressida consists of buyers of high-performance European cars such as the BMW. The Cressida is positioned against the BMW as offering comparable performance for a substantially lower cost.

Construct a segmentation matrix.

After customer- and product-related variables have been selected for identifying different

segments, a segmentation matrix can be developed. Two or more dimensions may be used to partition an industry.

For example, restaurants could be divided into four dimensions: type of cuisine, price range, type of service (e.g., sit-down, buffet, cafeteria, take-out, fast food) and location.



EXHIBIT 11. SEGMENTING THE BRITISH FROZEN FOOD INDUSTRY

		DISTRIBUTION CHANNELS				
		Supermarkets		Independent Grocery Retailers	Specialist Freezer Stores	Caterers
		Producers' Brands	Retailers' Brands			
P R O D U C T T Y P E S	Vegetables					
	Fruits					
	Meat Products					
	Desserts					
	Convenience Ready Meals					

Note: The above matrix identifies five categories of frozen food, and five distribution channels. While the basic distinction of customers is between retail and catering, within retailing there are three distinct categories of outlet: supermarkets, independent grocery stores, and specialist retailers of frozen food ("home freezer centres"). In addition, different market conditions exist for processors supplying frozen foods for sale under their own brand names as opposed to those supplying frozen foods for sale under the brand name of the retailer.

Source: Monopolies and Mergers Commission, *Frozen Foods* (HMSO, London 1976); and P. Geroski and T. Vlassopoulos, "The rise and fall of a market leader; Frozen foods in the UK," London Business School, Case series 9, 1989.

A segmentation matrix for the British frozen foods industry is presented in Exhibit 11. Five types of product and five channels of distribution are used to construct the two-dimensional segmentation matrix consisting of 25 potential segments. However, not every cell in the matrix may be relevant. Empty cells may represent future opportunities for products or services.

Analyze segment attractiveness.

Competitive assessments using industry structure analysis or core competencies analysis can also

be used to evaluate the profitability of different segments. However, the competitive focus shifts to an analysis of the different segments.

For example, in the frozen foods industry segmentation, independent grocers and caterers may be willing to substitute fresh fruits and vegetables for frozen goods. Therefore, the threat of substitutes within the segments and from outside sources must be carefully examined.



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In addition, the interrelationship among segments must be carefully considered. For example, caterers may purchase frozen food items from supermarkets at bargain prices. Segments may be natural buyers, sellers or substitutes for one another.

In the automobile industry, the luxury car and sports car segments were high-priced, high-margin products with less intense competition than other automobile segments. The introduction of high-quality, lower-priced Acura, Lexus and Infiniti autos changed the competitive structure of these high-priced segments.

Identify key success factors for each segment.

Quality, delivery, customer satisfaction, market share, profitability and return on investment are common measures of corporate success. In this regard, each segment must be assessed using the most appropriate key success factors. Cost and differentiation advantages should be highlighted by these measures.

Examination of differences among segments in buyers' purchase criteria can reveal clear differences in key success factors.

Analyze attractiveness of broad versus narrow segment scope.

A wide choice of segments for an industry requires careful matching of a firm's resources with the market. The competitive advantage of each segment may be identified in terms of low cost and/or differentiation.

Sharing costs across different market segments may provide a competitive advantage. For example, Gillette broadened its shaving systems to include electric shavers through its 1970 acquisition of Braun. Lipton recently entered the bottled iced-tea market.

On the other hand, when the Toro Company broadened its distribution channels for its snow blowers and lawnmowers to include discount chains, it almost went bankrupt. Feeling betrayed, a number of Toro's dealers dropped its products.

Taking a narrow segment focus may leave a firm vulnerable to competitors. For instance, by relying solely on its lemon-lime soft drink, 7-Up left itself at a competitive disadvantage to Coca-Cola and Pepsi. Recently, Hallmark Cards Co. has begun to market its premium image greeting cards through discounters. Hurt by discounters, some of Hallmark's 9,000 independent specialty shops have begun selling cards from Hallmark's competitors.

In many industries, aggressive firms are moving toward multiple-segment strategies. Campbell Soup, for example, makes its nacho cheese soup spicier for Texas and California customers and offers a Creole soup for Southern markets and a red-bean soup for Hispanic areas. In New York, Campbell uses promotions linking Swanson frozen dinners with the New York Giants football team; in the Sierra mountains, skiers are treated to hot soup samples. Developing multiple strategies is costly and often must be justified by an enhanced aggregate impact.

Some firms decide to avoid or abandon segments because of limited resources or because of uncertain attractiveness. For example, in the 1960s, IBM decided not to enter the mini-computer segment. This allowed upstart Digital Equipment Corp. to dominate this segment of the computer industry. General Electric abandoned the computer industry completely. Under CEO Jack Welch, GE's major segments must be first or second in market share, or risk being sold.



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A segment justifying a unique strategy must be of worthwhile size to support a business strategy. Furthermore, that business strategy needs to be effective with respect to the target segment in order to be cost effective. In general, it is costly to develop a strategy for a segment. The question usually is whether or not the effectiveness of the strategy will compensate for this added cost.

VIII. LIMITATIONS OF VALUE CHAIN ANALYSIS

Value chain analysis is neither an exact science nor is it easy. It is more art than preparing precise accounting reports. There are several limitations to the implementation and interpretation of value chain analysis. First, the internal data on costs, revenues and assets used for value chain analysis are derived from one period's financial information. For long-term strategic decision-making, changes in cost structures, market prices and capital investments from one period to the next may alter the implications of value chain analysis. Organizations should ensure that the value chain analysis is valid for future periods. Otherwise, the value chain analysis must be repeated under new conditions.

Identifying stages in an industry's value chain is limited by the ability to locate at least one firm that participates in a specific stage. Breaking a value stage into two or more stages when an outside firm does not compete in these stages is strictly judgmental.

As discussed previously, finding the costs, revenues and assets for each value chain activity sometimes presents serious difficulties. There is much experimentation underway that may provide better approaches. Having at least one firm operate in each value chain activity helps identify external prices for goods and services transferred between value chains. For intermediate products

or services with no external or competitive market information, transfer prices must be estimated on the basis of the best information available.

Isolating cost drivers for each value-creating activity, identifying value chain linkages across activities, and computing supplier and customer profit margins present serious challenges. The use of full cost assumes that the full capacity of the value chain activity's facilities is used to derive the costs. Plant and manufacturing personnel and vendors of equipment are good sources for capacity information. They can also be helpful in estimating the current or replacement cost of the assets. Independent companies, such as Valuation Research Corp. in Milwaukee, provide valuation services for assets.

Despite the calculational difficulties, experience indicates that performing value chain analysis can yield firms invaluable information on their competitive situation, cost structure, and linkages with suppliers and customers.

IX. ORGANIZATIONAL AND MANAGERIAL ACCOUNTING CHALLENGES

Value chain analysis offers an excellent opportunity to integrate strategic planning with management accounting to guide the firm to growth and survival. This change in focus for management accounting is necessary to maintain its critical role as the information profession.

The most significant challenge for senior management and management accountants is to recognize that the traditional, functional, internally oriented information system is inadequate for the firm engaged in global competition.

Another challenge for management accountants is to bring the importance of customer value to



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the forefront of managements' strategic thinking. For many managers and firms, this requires a great deal of education and awareness. Management accountants should take the initiative to bring the value chain message to major players in the firm. Seminars, articles, value chain examples and company-specific applications are useful to illustrate the advantages of value chain analysis.

Although value chain analysis requires expertise in internal operations and information, it demands a great deal of external information. Management accountants must seek relevant financial and non-financial information from sources outside the organization.

Management accountants must integrate databases and potential sources of timely information on competitive forces confronting the business. This calls for innovation and creativity in gathering and analyzing information for management decisions.

Designing internal and external information systems to assist managers in planning, monitoring and improving value-creating processes is another challenge facing management accountants.

Information technology is improving daily but existing information systems are slow to change. Management accountants should solicit support from all senior managers for allocating resources to develop and improve value chain-oriented information systems.

Value chain analysis requires the cooperation of all managers involved in value chain processes, including engineers, designers, production managers, marketing managers and distribution managers. Leadership from the CEO is vital to successful cooperation of managers. The

management accountant should ensure that the CEO is committed to value chain analysis and the organizational changes necessary for its successful implementation.

For many service companies, Porter's value chain model emphasizing manufacturing firms may appear inappropriate. However, every organization (banks, hospitals, airlines, professional firms) has a variety of primary and support value-creating activities to which value chain analysis applies. For example, a publishing company might have the following primary activities: information acquisition, editorial, production, distribution, sales and service. Support activities include new product and business development, technology assessment and development, human resource management and firm infrastructure. If strategy is seen as the pursuit of competitive advantage, the link between the formulation of service strategy and operational service delivery is vital.

X. CONCLUSION

As a unifying theme, value chain analysis presents organizations with an overarching tool for improving their strategic planning and resource allocation. The goal is to provide management with sufficient options to sustain its competitive advantage in an ever-changing business environment.

Analyzing costs and differentiation through the value chain is an essential component in the search for competitive advantage. The data problems are not insignificant and the answers will not always be precise.

Nevertheless, there will be considerable benefit in the debate that results from the process and in the enhanced quantitative awareness of the external competitive arena and of the firm's part in it. As so often in strategic planning, the process is often as valuable as the outcome.



APPENDIX: VALUE CHAIN ANALYSIS VS. CONVENTIONAL MANAGEMENT ACCOUNTING

Information generated from the traditional management accounting systems, including cost accounting, is generally unsuitable for value chain analysis for a variety of reasons. Exhibit A-1 provides a comparison of value chain analysis and traditional management accounting.

Generally, traditional management accounting focuses on internal information. It often places excessive emphasis on manufacturing costs. It also assumes that cost reduction must be found in the “value-added” process, i.e., selling price less the cost of raw material.

Using a value added approach can be misleading, since there are many other purchased inputs such as engineering, maintenance, distribution and service. The value-added process starts too late because it ignores linkages with suppliers, and stops too early because it ignores linkages with customers.

The value chain approach encompasses external and internal data, uses appropriate cost drivers for all major value-creating processes, exploits linkages throughout the value chain, and provides continuous monitoring of a firm’s strategic competitive advantage.



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EXHIBIT A-1. VALUE CHAIN VS. CONVENTIONAL MANAGEMENT ACCOUNTING

	Traditional Management Accounting	Value Chain Analysis in the Strategic Framework
Focus	Internal	External
Perspective	Value added	Entire set of linked activities from suppliers to end-use customers
Cost Driver Concept	Single cost driver (cost is a function of volume) Application at the overall firm level (cost-volume-profit analysis)	Multiple cost drivers – Structural drivers (e.g., scale, experience, technology and complexity) and – Executional drivers (e.g., participative management, total quality management and plant layout) A set of unique cost drivers for each value activity
Cost Containment Philosophy	“Across the board” cost reductions	View cost containment as a function of the cost drivers regulating each value activity Exploit linkages with suppliers Exploit linkages with customers Exploit process linkages within the firm “Spend to save”
Insights for Strategic Decisions	Somewhat limited	Identify cost drivers at the individual activity level, and develop cost/differentiation advantage either by controlling those drivers better than competitors or by reconfiguring the value chain (e.g., Federal Express in mail delivery, and MCI in long distance telephone) For each value activity, ask strategic questions pertaining to: – Make versus buy – Forward/backward integration Quantify and assess “supplier power” and “buyer power,” and exploit linkages with suppliers and buyers

Adapted from: Shank and Govindarajan, 1993.



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