

Strategic Cost Management: New Wine, or Just New Bottles?

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PROLOGUE

One piece of anecdotal evidence regarding the plight of management accounting today is presented in a recent paper in *Sloan Management Review* [Turney and Anderson, 1989]. The paper describes recent changes in the accounting systems for the Portables Division of the Tektronix Company (portable electric measuring instruments). The theme is a familiar one — a business facing stiff competition with survival hinging on a new manufacturing strategy for which implementation was being endangered by “obsolete and restrictive accounting systems.” The result seems a comforting one — the accounting systems were revised to bring them in line with the rest of the new operation, and the company is now prevailing over its competitors. But, a careful reading of exactly what changes were made at Tektronix should be chilling to anyone still committed to the AACSB’s recommended management accounting curriculum. In the process of creating what they term a system of “accounting for continuous improvement,” Tektronix decided to *totally eliminate* the following elements of its former management accounting system:

- the production work order reporting system
- standard product costs
- all cost variance reporting
- all flexible budgets for cost control
- all scrap and rework reporting systems
- monthly inventory tracking and reporting systems
- all accumulation of Work in Process (WIP) inventory cost
- monthly summary financial performance reports

What Tektronix substituted *instead* of these supposedly “core” systems makes very interesting reading. However, the core systems were dropped as being obsolete.

The same week this *Sloan Management Review* paper appeared, the American Management Association mailed promotional materials touting their latest seminar on “Fundamentals of Cost Accounting” (offered six times in early 1989, coast to coast, with CPE credit for CPAs). Also the same week, a firm specializing in up to date business software mailed to AAA members a sales brochure for a new software package called “The Management/Accounting Simulation” (designed specifically for courses in management accounting and cost accounting ... to maximize the educational

value ... of appropriate managerial accounting technique[s]."). The reader is encouraged to guess how many of the concepts Tektronix has dropped as being obsolete are still prominently featured in the bullet list of key topics for the new AMA seminar or the new simulation package.

NEW WINE?

In 1963 Sidney Davidson wrote a paper for *The Accounting Review* marking the 40th anniversary of the publication of J. M. Clark's book, *Studies in the Economics of Overhead Costs*. Davidson titled his retrospective of Clark's book "Old Wine in New Bottles." Davidson's paper acknowledged Clark's contributions to the development of relevant cost analysis—one of the "new bottles" of managerial accounting in 1963. Though times change, this metaphor remains apt. Are the "new" ideas fomenting today in management accounting really "new wine," or merely "old wine" recycled in "new bottles?" It is this author's belief, Sidney, that we really have ourselves some new wine here.

To coin a new mixed metaphor, although the winds of change are clearly blowing for management accounting, some observers believe that too many management accountants are asleep at the switch! What is the evidence that the fundamental concepts of management accounting are changing or that they need to change? What is the evidence that too many management accountants are lagging this change rather than leading it? What is the evidence to support Kaplan's charge [1986] that the management accounting taught for the past 30 years (since Anthony [1956]; Shillinglaw [1961]; and Horngren [1962] popularized the term) is becoming obsolescent? These are the questions this paper intends to address.

It is not the intent of the paper to belittle the accomplishments of the management accounting field over the past 30 years or to belittle the leadership efforts of those who have shaped and refined the current underlying conceptual framework. Management accounting could not go forward from here were it not for the achievements that have brought it this far. But, forward it must go. New times often call for new thinking.

The transition from "cost accounting" to "managerial cost analysis" is one primary accomplishment looking backward over the past 30 years. This transition has led to the prominence management accounting enjoys today in industry, commerce and academe. The transition from "managerial cost analysis" to what is called here "strategic cost management" (as will be defined below) is one primary challenge looking forward. Success in that next transition will help determine the prominence of cost management in the future.

Interest in strategic cost management derives from the rise to prominence of "strategy" in recent years. Several influential books have contributed to the current widespread prominence of "strategy."¹ Also, since the early 1970s, the major academic journals have begun to regularly publish articles about strategy.² Also during this period two journals have been

¹ See, for example, Andrews [1971], Chandler [1962], Henderson [1979], and Porter [1980, 1985].

² See, for example, Mintzberg [1978] in *Management Science*, Hambrick [1981] in *Administrative Science Quarterly*, Gupta and Govindarajan [1984] in *Academy of Management Journal* or Govindarajan [1986] in *Academy of Management Review*.

started which are devoted to strategic analysis, *Strategic Management Journal* and *Journal of Business Strategy*. The major management journals (*Harvard Business Review*, *Sloan Management Review*, *Business Horizons* or *California Management Review*) now also regularly publish articles about strategy.

Finally, there has arisen a billion dollar a year industry in strategic analysis. Even the CPA firms are now heavily involved in this consulting segment. Clearly, strategic analysis is now an important element of what is taught in business schools, what is written about in academic and management journals and what companies are concerned about.

However, to date there has been little attention given to this topic in the major research journals in accounting. Except for two papers in *The Accounting Review* (Kaplan [1984] and Patell [1987]), there are no references related to strategic analysis in *The Accounting Review*, *Journal of Accounting Research* or *Journal of Accounting and Economics*. *Accounting Organization and Society* has published related to strategy and control but not on strategic cost issues.

The dearth of attention to strategic analysis in the major research journals in accounting carries through to the managerial accounting textbooks as well. Only a few of the topics of strategic cost management receive some attention in only a few of the best selling management accounting texts.³ Further evidence of the lack of concern among management accountants with strategic topics is found in a recent survey by Robinson and Barrett [1988] of management accounting curricula. Their study measured the extent to which the topics prescribed by the AACSB for managerial accounting are being covered in accredited and non-accredited programs. Strategic topics are not mentioned anywhere in the report even once. The reader must look outside the major accounting journals and the accounting curricula in AACSB schools to find the literature about strategic cost management.⁴

In summary, two observations emerge. First, there is an extensive and rapidly growing literature about the concept of strategic cost management. Second, the ideas reflected in the concept have to date received scant attention in the leading accounting research journals, the leading textbooks, or graduate and undergraduate curricula. Which of these two observations is more reflective of the attention the concept "deserves" involves a "value judgment" which the reader is encouraged to consider very carefully. Tektronix is an example of one firm in which the new concepts have essentially replaced traditional managerial accounting. To help frame the reader's consideration of the concept, the paper will next present a definition of strategic cost management and then summarize the development of the field in terms of the three principal themes deemed to underlie it.

³ See, for example, the newest edition of Horngren and Sundem [1987] or Horngren and Foster [1987].

⁴ Michael Porter devotes substantial attention to the topic in both his major books [1980, 1985]. Other accounting books which address the topic include Kaplan and Johnson [1987], Bruns and Kaplan [1987] or Lee [1987]. Journal articles discussing some aspect of the topic includes Kaplan [1984, 1986], Rappaport [1987], Foster and Horngren [1988], Cooper and Kaplan [1988], Cooper [1987, 1989], Simmonds [1981], Shank and Govindarajan [1988 (a), (b), (c), (d), 1989 (a), (b)], and Howell *et al.* [1987].

Strategic Cost Management — Definition and Overview

It can be argued that one of the important roles of internal accounting information within a business is to facilitate the development and implementation of business strategies. Under this view, business management is a continuously cycling four stage process:

1. Formulating strategies
2. Communicating those strategies throughout the organization
3. Developing and carrying out tactics to implement the strategies
4. Developing and implementing controls to monitor the success of the implementation steps and hence the success in meeting the strategic objectives.

Cost information plays a role at each of these stages. From this perspective, Strategic Cost Management (SCM) can be defined as the managerial use of cost information *explicitly* directed at one or more of the four stages of the strategic management cycle. It is explicit attention to the strategic management *context* that distinguishes SCM from managerial accounting.

It is argued here that the emergence of SCM results from a blending of three underlying themes that are each taken from the strategic management literature. The three themes are:

1. Value Chain Analysis
2. Strategic Positioning Analysis
3. Cost Driver Analysis

Each of the three will be developed and illustrated in the following sections. Each represents a stream of research and analysis in which cost information is cast in a much different light from that in which it is viewed in conventional management accounting.

After presenting the three themes, it will be argued that, together, they represent a coherent framework for thinking about managerial accounting. Such a framework can be called a paradigm. It will be argued that the SCM framework, or paradigm, is sufficiently different from the conventional framework, or paradigm, that SCM cannot easily be accommodated within conventional topic lists. This difficulty in characterizing SCM using conventional management accounting concepts perhaps helps to explain the slowness in assimilating the strategic perspective into the discipline.

The "Value Chain" Concept

The first theme which underlies the work in strategic cost management concerns the focus of cost management efforts. Stated in question form:

How do we organize our thinking about cost management? In the SCM framework, managing costs effectively requires a broad focus, external to the firm. Porter [1980] has called this the "value chain." The "value chain" for any firm in any business is the linked set of value-creating activities all the way from basic raw material sources for component suppliers through to the ultimate end-use product delivered into the final consumers' hands. This focus is *external* to the firm, seeing each firm in the context of the overall chain of value-creating activities of which it is only a part, from basic raw material components to end-use consumers.

In contrast, management accounting today often adopts a focus which is largely *internal* to the firm — *its* purchases, *its* processes, *its* functions, *its* products and *its* customers. Another way of saying this is that management accounting takes a “value added” perspective, starting with payments to suppliers (purchases), and stopping with charges to customers (sales). The key theme is to maximize the difference (the value added) between purchases and sales.

But the “value chain” concept is fundamentally different from the “value added” concept. From a strategic perspective, the value added concept has two big problems; it starts too late and it stops too soon. Starting cost analysis with purchases misses all the opportunities for exploiting linkages with the firm’s suppliers. Such opportunities can be dramatically important to a firm. Consider the following example.

One of the major American automobile companies began a few years ago to implement “Just In Time” management concepts in its assembly plants [Houlihan, 1987]. Manufacturing costs represented 30 percent of sales for the auto firm. It was believed that applying JIT concepts could eliminate 20 percent of these costs because assembly costs in Japanese auto plants were known to be more than 20 percent below those in American plants. As the firm began to manage its factories differently to eliminate waste and the need for inventory buffers, its assembly costs did begin to drop noticeably. But, at the same time, the firm experienced dramatic problems with its major suppliers. They began to demand price increases which more than offset the assembly plant cost savings. The auto firm’s first response was to chide its suppliers that they, too, needed to embrace JIT concepts for their own operations.

A value chain perspective revealed a much different picture of the overall situation. Of the auto company’s sales, 50 percent was purchases from parts suppliers; of this amount, 37 percent was purchases by the parts suppliers and 63 percent was suppliers’ value added. Thus, suppliers were actually adding more manufacturing value to the auto than the assembly plants (63 percent x 50 percent = 31.5 percent, versus 30 percent). As the auto company reduced its own need for buffer stocks, it placed major new strains on the manufacturing responsiveness of its suppliers. The suppliers’ manufacturing costs went up more than the assembly plants’ costs went down.

The reason, once identified, was very simple. The assembly plants experienced huge and uncertain variability in their production schedules. One week ahead of actual production, the master schedule was more than 25 percent wrong 95 percent of the time. When the inventory buffers are stripped away from a highly unpredictable production process, the manufacturing activities of the suppliers become a nightmare. For every dollar of manufacturing cost the assembly plants saved by moving toward JIT management concepts, the suppliers’ plants spent much more than one dollar extra because of schedule instability.

Because of its narrow value added perspective, the auto company had ignored the impact of its changes on its suppliers’ costs. Management had ignored the idea that JIT involves a partnership with suppli-

ers. Management did not realize that a major element in the success of JIT for a Japanese auto assembly plant is schedule stability for its supplier firms. In fact, whereas the American plants regularly missed schedules only *one* week ahead by 25 percent or more, the Japanese plants varied 1 percent or less from schedules planned *four* weeks in advance [Jones and Udvardy, 1986].⁵ A failure to adopt a value chain perspective doomed this major effort by a leading American firm to failure. The lack of awareness of supply chain cost analysis concepts on the part of this company's management accountants proved to be a very costly oversight. Should those management accountants have been exposed to value chain concepts somewhere in their accounting education?

In addition to starting too late, value added analysis has another major flaw; it stops too soon. Stopping cost analysis at sales misses all the opportunities for exploiting linkages with the firm's customers. Customer linkages can be just as important as supplier linkages.

Exploiting customer linkages is the key idea behind the concept of "life cycle costing." Life cycle cost deals explicitly with the relationship between what a customer pays for a product and the total cost the customer incurs over the life cycle of using the product. Forbis and Mehta [1981] describe how a life cycle costing perspective on the customer linkage in the value chain can lead to enhanced profitability. Explicit attention to post-purchase costs by the customer can lead to more effective market segmentation and product positioning. Or, designing a product to reduce post-purchase costs of the customer can be a major weapon in capturing competitive advantage. In many ways, the lower life cycle cost of imported Japanese autos helps to explain their success in the American market.

Just as many cost management problems are misunderstood because of failure to see the impact on the overall value chain, many cost management opportunities are missed in the same way. Consider one further example.

In 1989, the American suppliers of paper to envelope converters are suffering a loss in profit because they are being caught unaware in a significant shift in the value chain of the envelope converter [Shank, 1990]. The shift from "sheet fed" to "roll fed" envelope finishing machines dramatically changes the raw material specifications for envelope paper. With "sheet fed" machines, the envelope company buys large rolls of paper (40 to 60 inches wide) which are first cut into sheets, then cut into blanks in die-cutting machines, and finally fed by hand into the folding and glueing machines. With "roll fed" machines, the envelope company buys very narrow rolls of paper (5 to 11 inches wide) which are converted directly into envelopes in one combined operation. "Roll fed" machines are much more expensive to buy but much less expensive to operate. For large orders, they represent substantial over-

⁵ The Japanese firms achieve much higher schedule stability because of dramatically lower levels of complexity in their product lines.

all savings for the envelope converter. "Roll fed" machines were only introduced in the U.S. about 1980 and now produce more than 60 percent of all domestic envelopes.

The paper manufacturers do not want to complicate their primary manufacturing process by producing rolls that are only 5 to 11 inches wide directly on the paper machines. Instead, they use secondary machines called "rewinder-slitters" to convert the large rolls of paper from the paper machines into the narrower rolls the converters now want. Thus, the transition from selling wide rolls to selling narrow rolls has added an additional processing step for the paper manufacturers. The business issue here is how the change in the customers' value chain should be reflected in paper prices. Now that manufacturing costs along the value chain have changed (in response to changed customer requirements) how should prices change?

In the paper industry, where management accounting does not include value chain analysis or life style costing, rewinder-slit costs are seen as just a small part of mill overhead which is assigned to all paper production on a per ton basis. For a large, modern paper mill, rewinder-slit cost is no more than one or two percent of total cost. The impact on total average cost per ton is less than \$10. Also, very little of this cost is variable with incremental production since the mill always keeps excess capacity in such a small department. It is common sense to make sure that \$300 million paper machines are never slowed down by a bottleneck at a \$2 million rewinder-slit.

The industry norm is to charge \$11 per ton extra if the customer wants the rolls slit to the narrow widths (less than 11 inches). The savings to the envelope converter from "roll fed" machines far exceed this extra charge. Unfortunately, the full cost to the paper mill of providing the incremental rewinding-slit service also far exceeds this extra charge. It can cost more than \$100 per ton to have an outside sub-contractor slit rolls to narrow widths. An external value chain perspective would look at the savings from narrow rolls for the customer and the extra costs to the paper mill and set a price differential somewhere in between. An internal mill costing perspective, however, sees no cost issue at all. The lack of a value chain perspective contributes to the lack of concern about product costing issues. The \$11 surcharge looks like pure extra contribution to profit. The result is an uneconomic price, the impact of which is buried in a mill management accounting system that ignores value chain issues. Should the management accountants in the paper companies have been exposed to value chain concepts somewhere in their management accounting education?

The "Strategic Positioning" Concept'

The second major theme underlying the work in strategic cost management concerns the perceived uses of management accounting information. Stated, again, in question form:

What role does cost management play in the firm? Again, the theme of SCM here can be stated very succinctly. In SCM, the role of cost analysis

differs in important ways depending on how the firm is choosing to complete. Following Porter's [1980] delineation of basic strategic choices, a business can compete either by having lower costs (cost leadership) or by offering superior products (product differentiation). That these two approaches demand very different conceptual frameworks has been widely accepted in the strategy literature.⁶ And, although strategic positioning does not really involve simple "either/or" choices in practice, the implications of strategic management have been frequently amplified.⁷ But, the implications of strategic positioning for management accounting are not as well explored. Since differentiation and cost leadership involve different managerial mindsets, they also involve different cost analysis perspectives. As one example of how strategic positioning can significantly influence the role of cost analysis, consider the decision to invest in more carefully engineered product standard costs. For a firm following a cost leadership strategy in a mature, commodity business, carefully engineered product standard costs are likely to be a very important on-going management control tool. But, for a firm following a product differentiation strategy in a market-driven, rapidly growing, fast changing business, carefully engineered standard manufacturing costs may well be much less important.

Shank, Govindarajan, and Spiegel [1988] cite an example in which a large chemical company uses cost variances extensively for some products and not at all for others depending on the strategic context. It is not surprising that monitoring of R&D productivity is much more important to a company like Merck than is manufacturing cost control. On the other hand, a system for better monitoring R&D costs would not gain much attention in a company like International Paper, but they have many accountants whose jobs involve tracking manufacturing cost variances on a regular monthly basis. Although cost information is important in all companies in one form or another, different strategies demand different cost perspectives.

Expanding upon the work by Gupta and Govindarajan [1984] and Govindarajan [1986], Table 1 summarizes some illustrative differences in control system or cost management emphases depending on the primary strategic thrust of the firm.

Govindarajan's widely cited work provides empirical evidence of major differences in cost management and control system design depending on the strategy being followed.

It is interesting to compare the SCM perspective on the role of cost information with the perspective that is more prevalent in management accounting today. Often, the theme in management accounting texts today is the same that it has been for 30 years. That theme was first articulated by Simon *et al.* [1954] who coined three phrases to capture the essence of management accounting: "scorekeeping," "problem solving," and "attention directing." Although these specific words are not always preserved, these three objectives still come through frequently in today's textbooks as clearly as they did when the Controllers Institute (which now is the Finan-

⁶ See, for example, Dess and Davis [1984], Gilbert and Strebler [1987], Hall [1980], Hambrick [1983], or Karnani [1984].

⁷ See Gupta and Govindarajan [1984], Wright [1987] or Shank and Govindarajan [1986].

Table 1

Primary Strategic Emphasis

	<u>Product Differentiation</u>	<u>Cost Leadership</u>
Role of standard costs in assessing performance	Not very important	Very important
Importance of such concepts as flexible budgeting for manufacturing cost control	Moderate to low	High to very high
Perceived importance of meeting budgets	Moderate to low	High to very high
Importance of marketing cost analysis	Critical to success	Often not done at all on a formal basis
Importance of product cost as an input to pricing decisions	Low	High
Importance of competitor cost analysis	Low	High

cial Executives Institute) commissioned a team of faculty from Carnegie Tech (which now is Carnegie Mellon University) to study the elements of effective controllership.⁸ It is interesting and somewhat ironic that Carnegie Tech and the Controllers Institute have long since been "modernized," but not this 1954 tripartite delineation of the roles of managerial accounting.

The point is not to deprecate *per se* this long standing common starting point, but rather to emphasize how much our conception of *what* we do starts with our consensus about *why* we do it. Each of the three well known roles involves a set of concepts and techniques that are implicitly assumed to apply to all firms, albeit, perhaps in varying degrees. For example, standard cost variances are a key tool for "attention-directing" and contribution margin analysis is a key tool for "problem solving."

Because the three roles are not seen as varying across firms depending on strategic context, the relevance of the related tool concepts also is not seen to vary across firms. If agreement could be reached that *why* we do management accounting differs in important ways depending on the basic strategic thrust of the firm, it would be a much easier transition to see that *how* we do management accounting should also reflect the basic strategic thrust.

Even if management accounting in most companies today is still heavily involved with conventional tasks, it is important to realize that this need not be true in the future. Management accounting can adapt to the real business needs of the firm, if those needs are articulated.

The "Cost Driver" Concept

What causes cost? In SCM it is acknowledged that cost is caused, or driven, by many factors that are interrelated in complex ways. Understanding cost behavior means understanding the complex interplay of the set of "cost drivers" at work in any given situation. At this level of generality, the idea is almost tautological. It is hardly contentious or counter-intuitive

⁸ See, for example, Chapter 1 in Horngren and Foster [1987], Davidson, Maher, Stickney and Weil [1985], Garrison [1988], or Anthony and Reece [1989].

until one contrasts it with the prevailing theme in traditional management accounting today. In management accounting today, cost is a function, primarily, of only one cost driver, output volume. Cost concepts related to output volume permeate the thinking and the writing about cost: fixed versus variable cost, average cost versus marginal cost, cost-volume-profit analysis, break even analysis, flexible budgets, and contribution margin, to name a few. In SCM, output volume *per se* is seen to capture very little of the richness of cost "behavior." Management accounting tends in this regard to draw upon the simple models of basic micro-economics. SCM, on the other hand, tends to draw upon the richer models of the economics of industrial organization [Scherer, 1980].

One other strategic cost driver, cumulative experience, has also received some attention among management accountants over the years as a determinant of unit costs.⁹ References to the "learning curve" also appear in many managerial accounting texts.¹⁰ However, rather than seeing experience as one of many "cost drivers," the accounting literature sees it more narrowly as an explanation of how the relationship between cost and output volume changes over time as cumulative output increases for one particular product or process. That is, even in the "learning curve" literature in accounting, output volume is still the pre-eminent cost driver. Experience is seen as a phenomenon which can help explain the changing relationship between output volume and cost over time.

If output volume is a poor way to explain cost behavior, what is a better way? Porter [1985] presents one attempt to create a comprehensive list of cost drivers, but his attempt is more important than his particular list. In the strategic management literature better lists exist [Riley, 1987]. Following Riley, the following list of cost drivers is broken into two categories. The first category is what are called "Structural" cost drivers, drawing upon the industrial organization literature [Scherer, 1980]. From this perspective there are at least five strategic choices by the firm regarding its underlying economic *structure* that drive cost position for any given product group:

- Scale — How big an investment to make in manufacturing, in R&D and in marketing resources.
- Scope — Degree of vertical integration. Horizontal integration is more related to scale.
- Experience — How many times in the past the firm has already done what it is doing again.
- Technology — What process technologies are used at each step of the firm's value chain.
- Complexity — How wide a line of products or services to offer to customers.

Each structural driver involves choices by the firm that drive product cost. Given certain assumptions the cost calculus of each structural driver can be specified.¹¹ Of the structural drivers, scale, scope and experience

⁹For a recent comprehensive reference, see Liao [1988].

¹⁰See, for example, Deakin and Maher [1984] or Kaplan [1982].

¹¹See, for example, *The Arithmetic of Strategic Cost Analysis* [Ghemawat, 1986] or the Titanium Dioxide Case series [Porter, 1986].

have received a large amount of attention from economists and strategists over the years. Of these three, only experience has drawn much interest from management accountants, as noted above. Technology choice is a sufficiently thorny topic area that it is not really surprising that management accountants have pretty much ignored it. At the level of explicit analysis, so have most other people as well. Perhaps the most explicit work that deals with cost analysis for technology choices is in industrial economics. Gold [1970] and Oster [1982] represent excellent examples regarding innovations in the steel industry. Complexity, as a structural variable, has received the most attention among accountants recently. For examples of the potential importance of complexity as a cost determinant see the work on "activity based costing" by Kaplan [1987], Cooper [1986], or Shank and Govindarajan [1988(b)].

The second category of cost drivers, "Executional" drivers [Riley, 1987], are those determinants of a firm's cost position which hinge on its ability to "execute" successfully. Whereas "structural" cost drivers are *not* monotonically scaled with performance, "executional drivers" are. That is, for each of the structural drivers, *more* is not always *better*. There are diseconomies of scale, or scope, as well as economies. A more complex product line is not necessarily better or necessarily worse than a less complex line. Too much experience can be as bad as too little in a dynamic environment. Texas Instruments emphasized the learning curve and became the world's lowest cost producer of obsolete microchips. Technological leadership versus followership is a legitimate choice for most firms.

In contrast, for each of the "executional" drivers, more is always better. The list of basic executional drivers includes at least the following:

- work force involvement ("participation") — the concept of work force commitment to continual improvement
- total quality management (beliefs and achievement regarding product quality)
- capacity utilization (given the scale choices on plant construction)
- plant layout efficiency (how efficient, against current norms, is the layout?)
- product configuration (is the design or formulation effective?)
- exploiting linkages with suppliers and/or customers, per the firm's value chain

Operationalizing each of these drivers also involves specific cost analysis issues, as will be illustrated below. Many strategy consultants maintain that the strategic cost analysis field is moving very quickly toward "executional" drivers because the insights from analysis based on "structural" drivers are too often "old hat." It is somewhat ironic that the cost driver concept is moving from one revolution to a second one before the accounting world has caught up with the first one.

As of this writing there is no clear agreement on the list of "fundamental" cost drivers. For example, two different lists are proposed in one single publication [Booz, Allen, Hamilton, 1987]. However, those who see cost behavior in strategic terms are clear that output volume alone does not typically catch enough of the richness. How unit cost changes as output volume changes in the short run is seen to be a less interesting question

than how cost position is influenced by the firm's comparative position on the various drivers that are relevant in its competitive situation.

Whatever items are on the list, the key ideas are as follows:

1. For strategic analysis, volume is usually not the most useful way to explain cost behavior.
2. What is more useful in a strategic sense is to explain cost position in terms of the structural choices and executional skills which shape the firm's competitive position. For example Porter [1986] analyzes the classic confrontation between GE and Westinghouse in steam turbines in 1962 in terms of the structural and executional cost drivers for each firm.
3. Not all the strategic drivers are equally important all the time, but some (more than one) of them are very probably very important in every case. For example, Porter [1986] develops a strategic assessment of Dupont's position in Titanium dioxide based primarily on scale and capacity utilization issues.
4. For each cost driver there is a particular cost analysis framework which is critical to understanding the positioning of a firm. Being a well-trained cost analyst requires knowledge of these various frameworks. This is illustrated below.

The underlying cost analysis framework for one of the "soft" executional drivers, quality management, will be described next to demonstrate that each of the many cost drivers does in fact have an underlying analytic framework. There is a very well-developed literature on cost of quality (COQ) analysis.¹² This topic area is rich in measurement issues and in controversy about managerial impact. Yet it is virtually ignored in the conventional accounting literature. The fact that COQ analysis is so well-developed and so rich and yet apparently so foreign to accounting authors makes it a good example for the reader who is still wondering whether SCM warrants more attention.

The basic managerial dilemma for COQ analysis is summed up by the following rather fundamental difference of opinion. On the one hand, some authors believe that COQ analysis is a complete waste of time [Deming, 1982]. For Deming, time spent figuring out what it costs because of doing things wrong would be much better spent doing things right the first time. Quite literally, Deming sees cost analysis for quality as a misguided waste of time. On the other hand, other authors believe that the overall cost of quality curve is U-shaped [Juran, 1985]. For Juran, regular, on-going COQ analysis is critical if management is to insure that the firm is operating in the relatively flat part of the COQ curve.

If one adopts Juran's perspective, the relevant analytic framework is to measure and monitor quality costs in terms of a four-part breakdown:

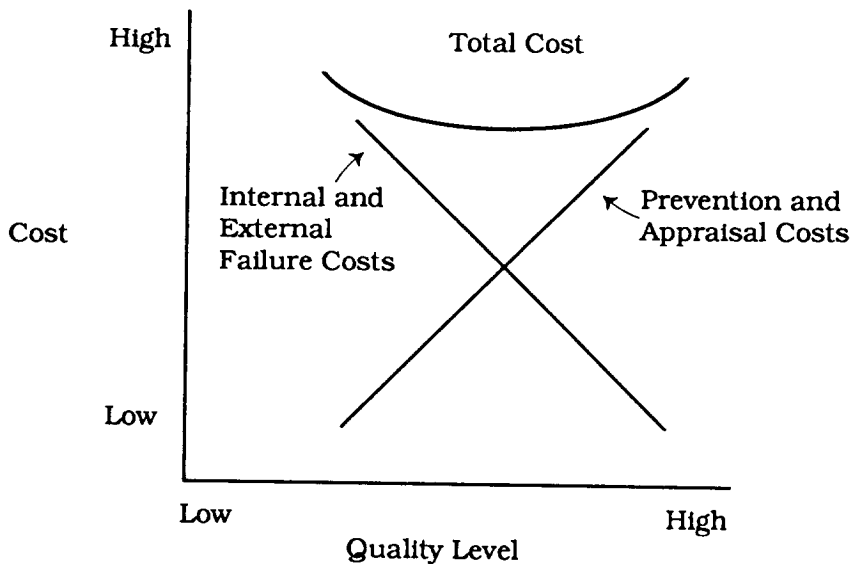
1. Prevention — Costs of preventing bad quality (such as worker "quality circles")
2. Appraisal — Costs of monitoring the level of bad quality (such as scrap reporting systems)
3. Internal Failure — Costs of fixing bad quality which is discovered before it leaves the factory (such as "rework" labor)

¹²Juran [1970], Crosby [1979], Garvin [1987], Simpson and Muthler [1988].

4. **External Failure** — Costs of bad quality which is not discovered before it is shipped (such as warranty claims or customer “illwill”)

Within this perspective, as shown in the chart below, the first two categories reflect a *positive* slope if plotted against the level of quality (measured by product defects). That is, the more one spends on prevention and appraisal the *higher* the level of quality. On the other hand, the last two categories reflect a *negative* slope when plotted against the level of quality. The lower the level of quality (more defects) the higher the cost of product failures, whether discovered before or after the product is shipped. This contrast in slopes gives rise to the U-shape of the additive total cost curve. It also gives rise to the concept that effective strategic management of quality means choosing that quality level and mix of spending across the four categories which minimizes total quality cost.

If one accepts this perspective, COQ analysis becomes an important on-going management control tool beyond just measuring quality in non-financial terms (first pass yield rates, defect rates, etc.). On the other hand, if one believes that it is conceptually and strategically impossible to have “too high” a quality level [Deming, 1982], COQ analysis is a misguided waste of time and money. Given the central prominence which discussions about quality play in the economy today, it seems puzzling that cost of quality analysis is absent from accounting curricula and accounting journals.



From the multiple cost drivers perspective, reducing cost behavior to a question of fixed, variable and mixed costs just does not begin to “explain” costs in a way that is useful in making future strategic choices. In fact, focussing on fixed versus variable costs can actually be dangerous, strategically. According to Simpson and Muthler [1987] it was the misguided belief that profit was more a function of efficient plant operation (spread the fixed costs) than of minimizing product defects (a cost of quality issue) that led Ford Motor Company to the brink of insolvency in the 1970s. In

Ford's case, attention to the broader set of relevant cost drivers (such as quality, complexity and product design) helped restore the firm to profitability even though these cost drivers were not explicitly a part of their management accounting system then. They are now.

Strategic Management and Strategic Cost Analysis

It is argued here that the emerging concept of SCM is a blending of the financial analysis elements of these three themes from the strategic management literature—value chain analysis, strategic positioning analysis, and cost driver analysis. At each of the four stages of the strategic management cycle, these three themes recur regularly in a firm's efforts to achieve sustainable competitive advantage. For each of the themes, conventional managerial accounting has not provided the financial analysis support deemed necessary by writers about strategy, by strategic consultants, or by executives striving to implement strategic management in their firms. The financial analysis which is emerging to meet those needs is SCM.

Why these themes and techniques have not had a broader impact on mainstream management accounting is puzzling. One possible answer, rejected by the author, is that SCM is merely a slick charade which management accountants with a truly firm commitment to their roots are easily able to see through. Rather, paraphrasing Henry Thoreau's famous quip to Ralph Waldo Emerson from inside Concord jail, the real question is not why some persons are caught up, but rather why the mainstream is not.

Another possible explanation for the lack of mainstream attention to SCM is discussed in the following section of the paper.

Strategic Cost Management — A Paradigm Shift?

The power of paradigms to shape collective thinking is well-documented. Kuhn's [1970] work introduced this concept. Burrell and Morgan [1979] apply it to the social sciences. The concept has even been recently applied to the strategic management literature [Pralhad and Bettis, 1986]. Also well-documented is the slow adjustment of collective thinking to new ideas which are sufficiently different that they represent a shift in an underlying paradigm or schema [Weick, 1979]. Since "believing is seeing," in Weick's words, it is often very difficult to get people to "see" the need to change their beliefs. As noted above, strategic cost management may represent a sufficiently different mode of thought about management accounting that it represents a kind of paradigm shift. This is certainly not a shift in the same sense that Copernican astronomy replaced the Ptolemaic view or that Einsteinian physics replaced the Newtonian view. Much more modest changes are at work here. Also, rather than being totally different, the SCM perspective is just more inclusive than the management accounting perspective.

Taken individually, most of the pieces of SCM require substantial change in the way we think about what we do and why we do it. Some pieces, however, such as activity based costing, are not really new at all. Rather they stem from a reawakened awareness of "old wine." In the case of activity based costing, the old wine is the "traceability" concept [Shillinglaw, 1961]. Thus the importance of activity based costing stems from widespread

implementation problems in applying the traceability concept in complex product situations rather than from any theoretical shortcomings in the "old wine." On the other hand, many of the individual SCM concepts, such as life cycle costing, or value chain analysis, or cost of quality, are sufficiently different from conventional ways of thinking that they cannot easily be accommodated into the list of key topic areas. They are "new wine." It is as if one is thinking in terms of "round," "square," or "triangular" and then is asked to fit "green" into the list. Color just does not fit a shape paradigm.

Further, accepting all of the concepts in SCM together requires rejecting some of the basic attitudes which shape current thinking about management accounting. One has to discard some elements of the old paradigm in favor of the new one. Contribution margin analysis, for example, plays almost no role in SCM, which adopts a long run perspective in thinking about product cost. Davidson struggled in 1963 to explain Clark's concern for fully absorbed cost. Full cost was already outdated old thinking in 1963. Davidson considered the "old wine" of contribution margin analysis from Clark to be much more relevant to modern management accounting in 1963 than the old wine of full absorption costing which also shaped Clark's thinking. In this case, the "new" thinking in 1989 is fully consistent with the "old-old" thinking of 1923, even though the 1989 thinking is inconsistent with the "old-new" thinking which has dominated from 1963 until the present.

Thus, SCM involves some ideas which are fully consistent with the management accounting paradigm but are not well implemented today (activity based costing), some ideas which are largely outside the scope of the conventional paradigm (cost of quality), and some ideas which are inconsistent with the conventional paradigm (full cost is preferable to variable cost). Is it overreaching to describe SCM as a "new" paradigm? Or, is it overreaching in the first place to argue that there is, in fact, an underlying paradigm of conventional management accounting at all?

With full cognizance of the limitation noted here, each of the three themes of SCM discussed above can be contrasted with a parallel theme from conventional management accounting. From this perspective, each of the three themes deals with a basic question for which SCM and management accounting pose answers which tend to differ substantially. It is that set of three basic questions with two very different sets of answers which constitutes the crux of the paradigm shift idea. Table 2 summarizes this view of the two paradigms.

Until management accountants are ready to look at these three basic questions from the extended perspective of SCM, they will continue to underestimate the significance of the turmoil surrounding management accounting in a great many companies today. Perhaps the turmoil applies to "most" companies. Forty of the leading manufacturing firms in the U.S. and Europe, working through a consortium formed to study new manufacturing concepts (Computer Aided Manufacturing International), have jointly proposed a radical redesign of management accounting systems [Berliner and Brimson, 1988]. The National Association of Accountants has also published a book which documents the dramatic need for changed management accounting systems [Howell *et al.*, 1987]. The Financial Execu-

tives Institute, working through its research foundation (FERF), has recently commissioned a major new study to document successful applications in American business of the new concepts of strategic cost management in order to encourage its member firms to re-evaluate the basic effectiveness of their management accounting systems.

The winds of change are blowing, and it is no longer a mild breeze. When will it be time for mainstream academic management accounting to take heed?

	Table 2	
	The Management Accounting Paradigm	The Strategic Cost Management Paradigm
I. What is the most useful way to analyze costs?	In terms of: products customers functions And, with a strongly <i>internal</i> focus. "Value added" is a key concept	In terms of the various stages of the overall value chain of which the firm is a part And, with a strongly <i>external</i> focus. "Value added" is seen as a dangerously narrow concept
II. What is the objective of cost analysis?	There are three objectives which all apply without regard to the strategic context: scorekeeping attention directing problem solving	Although the three objectives are always present, the design of cost management systems changes dramatically depending on the basic strategic positioning of the firm: under a cost leadership strategy . . . under a product differentiation strategy . . .
III. How should we try to understand cost behavior?	Cost is primarily a function of output volume: variable cost fixed cost step cost mixed cost	Cost is a function of strategic choices about the structure of how to compete and managerial skill in executing the strategic choices: "Structural" cost drivers . . . "Executional" cost drivers . . .

REFERENCES

- Andrews, Kenneth, *The Concept of Corporate Strategy* (Richard D. Irwin, 1971).
- Anthony, Robert, *Management Accounting* (Richard D. Irwin, 1956).
- , and James Reece, *Management Accounting: Text and Cases*. Eighth Ed. (Richard D. Irwin, 1988).
- Berliner, Callie, and James Brimson, Eds., *Cost Management for Today's Advanced Manufacturing* (Harvard Business School Press, 1988).
- Booz, Allen, and Hamilton, *Manufacturing Issues* (New York, 1987).
- Bruns, William, and Robert Kaplan, Eds., *Accounting and Management: Field Study Perspectives* (Harvard Business School Press, 1987).
- Burrell, G., and G. Morgan, *Sociological Paradigms and Organizational Analysts* (Heineman, 1979).
- Buzzell, Robert, et al., "Market Share — A Key to Profitability," *Harvard Business Review* (January-February, 1975).
- Chandler, Alfred, *Strategy and Structure* (MIT Press, 1962).
- Cooper, Robin, "You Need a New Cost System When ..." *Harvard Business Review* (January-February, 1989).
- , "Does Your Company Need a New Cost System?" *Journal of Cost Management* (Spring, 1987).
- , Schrader Bellows Cases. #9-186-272, Harvard Business School, 1986.
- , and Robert Kaplan, "Measure Costs Right: Make the Right Decisions," *Harvard Business Review*, September-October, 1988.
- Crosby, Phillip, *Quality is Free* (McGraw-Hill, 1979).
- Davidson, Sidney, "Old Wine into New Bottles." *The Accounting Review* (April 1963).
- , et al., *Managerial Accounting*, Second Edition (The Dryden Press, 1985).
- Deakin, E. B., and M. W. Maher, *Cost Accounting* (Richard D. Irwin, 1984).
- Deming, Edward, *Quality, Productivity and Competitive Position* MIT Center for Advanced Engineering Study (1982).
- Dess, G. G., and P. S. Davis, "Porter's (1980) Generic Strategies as Determinants of Strategic Group Membership and Organizational Performance," *Academy of Management Journal*. Vol. 27 (1984).
- Forbis, John, and Nitin Mehta, "Value-based Strategies for Industrial Products." *Business Horizons* (May 1981).
- Foster, George, and Charles Horngren, "Cost Accounting and Cost Management in a JIT Environment," *Journal of Cost Management* (Winter 1988).
- Garrison, Ray, *Management Accounting*, Fifth Edition, BPI (1988).
- Garvin, David, "Competing on the Eight Dimensions of Quality," *Harvard Business Review* (November-December, 1987).
- Ghemawat, Pankaj, *The Arithmetic of Strategic Cost Analysis*, Harvard Business School (1986).
- Gilbert, Xavier, and Paul Strebel, "Strategies to Outpace Competition," *Journal of Business Strategy* (Summer 1987).
- Gold, Bela, et al., "Diffusion of Major Technological Innovation in U.S. Iron and Steel Manufacturing." *Journal of Industrial Economics* (July 1970).
- Govindarajan, Vijay, "Decentralization, Strategy and Effectiveness of Strategic Business Units in Multibusiness Organizations," *Academy of Management Review* (October 1986).
- , and John Shank, "Concepts in Strategic Cost Analysis: The 'Famous' Crown, Cork and Seal Case," *Journal of Cost Management* (Winter 1989(a)).
- , and ———, "Profit Variance Analysis: A Strategic Focus," *Issues in Accounting Education* (Fall 1989 (b)).
- Gupta, A. K. and V. Govindarajan, "Business Unit Strategy, Managerial Characteristics and Business Unit Effectiveness in Strategy Implementation." *Academy of Management Review* (October 1986).
- Hall, William, "Survival Strategies in a Hostile Environment." *Harvard Business Review* (January-February, 1980).
- Hambrick, Donald, "High Profit Strategies in Mature Capital Goods Industries: A Contingency Approach," *Academy of Management Journal* (1983). Vol. 26.
- , "Environment, Strategy and Power within the Top Management Team." *Administrative Science Quarterly* (1981). Vol. 26.

- Henderson, Bruce, *Henderson on Corporate Strategy* (ABI Books, 1979).
- Hornngren, Charles, *Cost Accounting: A Managerial Emphasis* (Prentice Hall, 1962).
- , and George Foster, *Cost Accounting: A Managerial Emphasis*, Sixth Edition (Prentice-Hall, 1987).
- , and Gary Sundem, *Introduction to Management Accounting*, Seventh Edition (Prentice-Hall, 1987).
- Houlihan, John, "Exploiting the Industrial Supply Chain," *Manufacturing Issues* (Booz, Allen, Hamilton, New York, 1987).
- Howell, Robert, and Stephen Soucy, "Operating Controls in the New Manufacturing Environment," *Management Accounting* (October, 1987).
- , et al., *Management Accounting in the New Manufacturing Environment*. National Association of Accountants (1987).
- Jones, Thomas, and Franklin Udvar, "Just in Time Challenges for U.S. Auto Suppliers' Industry," *Manufacturing Issues* (Booz, Allen and Hamilton, New York, 1986).
- Juran, Joseph, "The Quality Edge: A Management Tool." *PIMA* (May, 1985).
- , and Frank Gryna, *Quality Planning and Analysis* (McGraw-Hill, 1970).
- Kaplan, Robert, John Deere Cases, #9-187-107 (Harvard Business School, 1987).
- , "Accounting Lag: The Obsolescence of Cost Accounting Systems," *California Management Review* (Winter, 1986).
- , "Measuring Manufacturing Performance, A New Challenge for Management Accounting Research." *The Accounting Review* (April 1984).
- , *Advanced Management Accounting* (Prentice-Hall, 1982).
- , and Thomas Johnston, *Relevance Lost! The Rise and Fall of Management Accounting* (Harvard Business School Press, 1987).
- Karnani, A, "Generic Competitive Strategies: An Analytic Approach." *Strategic Management Journal* (1984). Vol. 15.
- Kuhn, Thomas, *The Structure of Scientific Revolutions*, Second Edition (University of Chicago Press, 1970).
- Lee, John, *Managerial Accounting Changes for the 1990s* (McKay Business Systems, 1987).
- Liao, Shu, "The Learning Curve: Wright's Model vs. Crawford's Model," *Issues in Accounting Education* (Fall 1988).
- Mintzberg, Henry, "Patterns in Strategy Formulation," *Management Science* (1978). Vol. 24.
- Oster, Sharon, "The Diffusion of Innovation Among Steel Firms, The Basic Oxygen Furnace," *The Bell Journal of Economics* (Spring 1982).
- Patell, James, "Cost Accounting, Process Control and Product Design: A Case Study of the Hewlett Packard Personal Office Computer Division," *The Accounting Review* (October 1987).
- Porter, Michael, *GE vs. Westinghouse in Large Turbine Generators*, #9-380-128 (Harvard Business School, 1986).
- , *Competitive Advantage* (The Free Press, 1985).
- , *Competitive Strategy* (The Free Press, 1980).
- Prahalad, C. K., and R. A. Bettis, "The Dominant Logic: A New Linkage Between Diversity and Performance," *Strategic Management Journal* (1986)., Vol. 7.
- Rappaport, Alfred, "Linking Competitive Strategy and Shareholder Value Analysis." *The Journal of Business Strategy* (Spring 1987).
- Riley, Daniel, "Competitive Cost Based Investment Strategies for Industrial Companies," *Manufacturing Issues* (Booz, Allen, Hamilton, New York, 1987).
- Robinson, Michael, and M. Edgar Barrett, "The Content of Managerial Accounting Curricula," *The Accounting Educators Journal* (Spring 1988).
- Scherer, F. M., *Industrial Market Structure and Economic Performance*, Second Edition (Rand McNally, 1980).
- Shank, John, "Strategic Implications of Activity Based Costing: A Field Study," *Journal of Cost Management* (Forthcoming 1990).
- , and V. Govindarajan, "The Perils of Product Costing Based on Output Volumes," *Accounting Horizons* (December 1988 (a)).
- , and ———, "Transaction-based Costing for the Complex Product Line, A Field Study," *Journal of Cost Management* (Summer 1988 (b)).

- , and ——, "Making Strategy Explicit in Cost Analysis: A Case Study," *Sloan Management Review* (Spring 1988 (c)).
- , and ——, "Cash Sufficiency: Missing Link in Portfolio Planning," *Journal of Business Strategy* (Summer 1986).
- , ——, and Eric Spiegel, "Strategic Cost Analysis: A Case Study," *Journal of Cost Management* (Fall 1988).
- Shillinglaw, Gordon, *Cost Accounting: Analysis and Control* (Richard D. Irwin, 1961).
- Simmonds, Kenneth, "Strategic Management Accounting," *Management Accounting (U.K.)* (April 1981).
- Simon, Herbert, et al., *Centralization versus Decentralization in Organizing the Controller's Department*, The Controllership Foundation, Inc. (1954).
- Simpson, James, and David Muthler, "Quality Costs: Facilitating the Quality Initiative," *Journal of Cost Management* (Spring 1987).
- Turney, Peter, and Bruce Anderson, "Accounting for Continuous Improvement." *Sloan Management Review* (Winter 1989).
- Weick, Karl, *The Social Psychology of Organizing*. Second Edition (Addison-Wesley, 1979).
- Wright, Peter, "A Refinement of Porter's Strategies." *Strategic Management Journal* (1987). Vol. 8.