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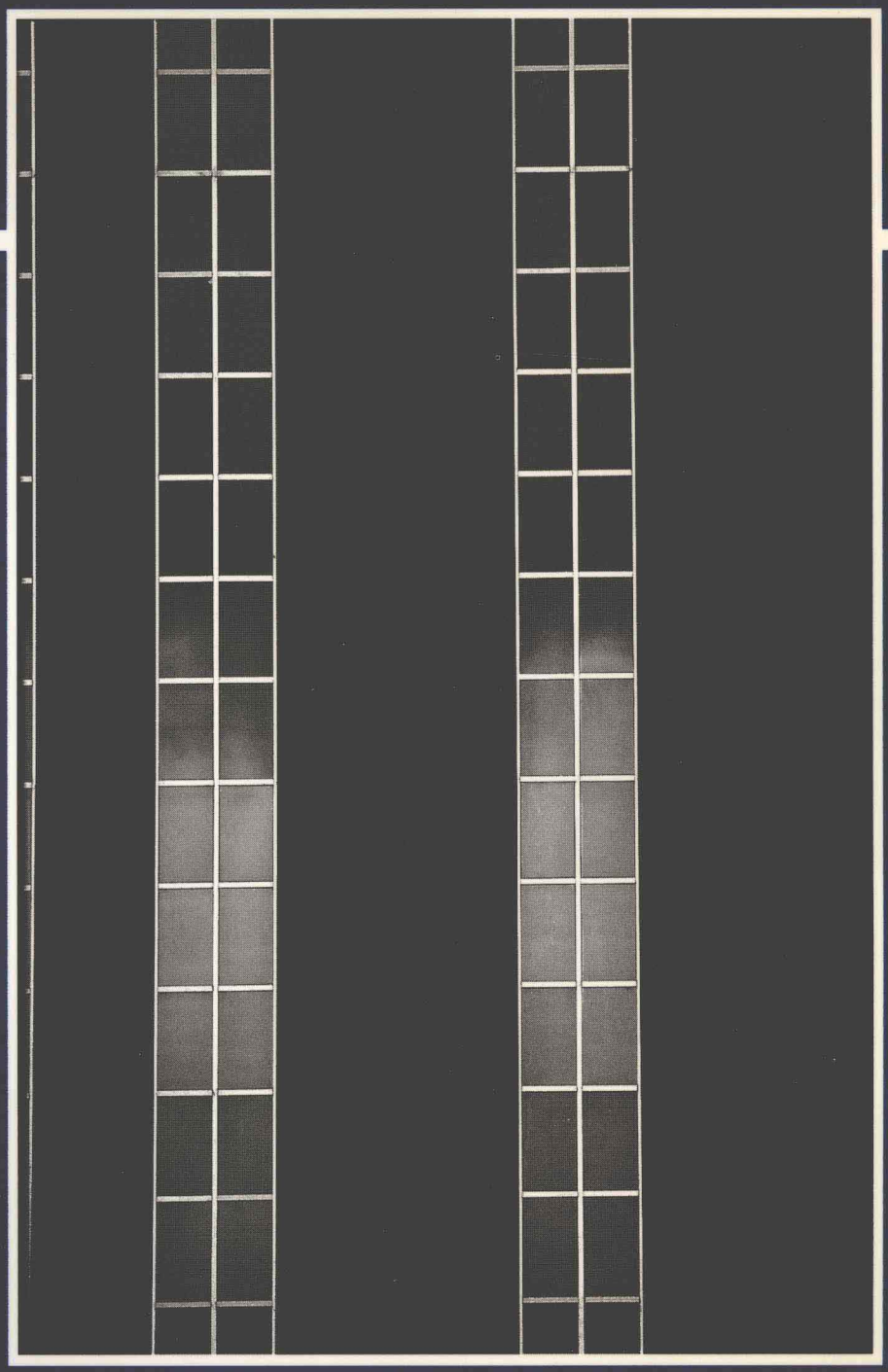

INSIGHTS

Readings in Cost Accounting

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PREFACE

This readings book has been developed to supplement your text by providing a taste of the valuable, contemporary business literature that illustrates the real world applicability of the topics included in *Cost Accounting: Traditions and Innovations*. This book by no means contains an exhaustive compilation of the ever-expanding body of literature in the field of cost/management accounting. However, these articles have been selected because they are current, relevant, and readable. To provide a well-rounded perspective, authors from industry, public accounting, and academia have been selected. For the sake of completeness, controversial topics have not been excluded. It is hoped that the selections will provide practical examples of accounting techniques and will serve to promote classroom discussion and critical thinking skills about the positive and negative aspects of the various topics.

This readings book is organized on a chapter by chapter basis. Some articles may relate equally well to other chapters; the cross-references are listed by author on pages vii and viii. A longer list is included in the Instructor's Manual to the text.

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Michael R. Kinney

CROSSREFERENCES

In addition to the chapter association shown in the Table of Contents, readings may pertain to the material in chapters indicated below.

1. Makoto Kawada and Daniel F. Johnson

   Chapter 5: Activity-Based Cost Systems for Management, Chapter 11: General Concepts of Standard Costing; Material and Labor Standards, Chapter 12: Standard Costing for Overhead, Chapter 18: Control of Inventory and Production, Chapter 22: Measuring Organizational Performance

2. Rahul Jacob

   Chapter 22: Measuring Organizational Performance

3. David M. Buehlmann and Donald Stover

   Chapter 3: Considering Quality in an Organization

4. Adel M. Novin

   Chapter 5: Activity-Based Cost Systems for Management, Chapter 12: Standard Costing for Overhead

5. William O. Stratton

   Chapter 4: Developing Predetermined Overhead Rates, Chapter 5: Activity-Based Cost Systems for Management, Chapter 12: Standard Costing for Overhead, Chapter 14: Cost-Volume-Profit Analysis

6. C. Mike Merz and Arlene Hardy

   Chapter 2: Cost Terminology and Cost Flows, Chapter 4: Developing Predetermined Overhead Rates

7. James T. Mackey and Vernon H. Hughes

   Chapter 5: Activity-Based Cost Systems for Management, Chapter 18: Control of Inventory and Production, Chapter 22: Measuring Organizational Performance

8. Richard P. Mager

   Chapter 1: The Contemporary Environment of Cost and Management Accounting, Chapter 5: Activity-Based Cost Systems for Management, Chapter 17: Cost Control for Discretionary Costs

9. Yasuhiro Monden and John Lee

   Chapter 3: Considering Quality in an Organization, Chapter 11: General Concepts of Standard Costing; Material and Labor Standards, Chapter 12: Standard Costing for Overhead

10. Jacci L. Rodgers, S. Mark Comstock, and Karl Pritz

    Chapter 4: Developing Predetermined Overhead Rates, Chapter 5: Activity-Based Cost Systems for Management, Chapter 7: Job Order Costing, Chapter 13: Absorption and Variable Costing

11. Linda F. Christensen and Douglas Sharp

    Chapter 4: Developing Predetermined Overhead Rates, Chapter 5: Activity-Based Cost Systems for Management, Chapter 17: Cost Control for Discretionary Costs, Chapter 21: Responsibility Accounting and Transfer Pricing in Decentralized Organizations

12. Donald W. Ramey

    Chapter 16: The Master Budget, Chapter 17: Cost Control for Discretionary Costs, Chapter 21: Responsibility Accounting and Transfer Pricing in Decentralized Organizations, Chapter 22: Measuring Organizational Performance

13. Alfred M. King

    Chapter 3: Considering Quality in an Organization, Chapter 5: Activity-Based Cost Systems for Management, Chapter 6: Additional Overhead Allocation Concepts and Issues, Chapter 19: Basics of Capital Budgeting

14. Mark C. DeLuzio

    Chapter 18: Control of Inventory and Production

15. Shannon M. McKinnon and William J. Bruns, Jr.

    Chapter 1: The Contemporary Environment of Cost and Management Accounting, Chapter 5: Activity-Based Costs Systems, Chapter 22: Measuring Organizational Performance

16. Pamela H. Church and Kenneth R. Lambert

    Chapter 19: Basics of Capital Budgeting, Chapter 20: Advanced Capital Budgeting Topics

17. Robert W. Hall

    Chapter 3: Considering Quality in an Organization

18. Shawn Tully

    Chapter 3: Considering Quality in an Organization, Chapter 22: Measuring Organizational Performance

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CONTENTS:

Chapter 1 - Contemporary Environment of Cost and Management Accounting

1. "Strategic Management Accounting - Why and How"
   by Makoto Kawada and Daniel F. Johnson 1

Chapter 3 - Considering Quality in an Organization

2. "TQM - More Than a Dying Fad?"
   by Rahul Jacob 13
3. "How Xerox Solves Quality Problems"
   by David M. Buehlmann and Donald Stover 19

Chapter 4 - Developing Predetermined Overhead Rates

4. "Applying Overhead: How to Find the Right Bases and Rates"
   by Adel M. Novin 25

Chapter 5 - Activity-Based Cost Systems for Management

5. "ABC: An All-Purpose Solution for Financial Reporting"
   by William O. Stratton 31
6. "ABC Puts Accountants on Design Team at HP"
   by C. Mike Merz and Arlene Hardy 41

Chapter 7 - Job Order Costing

7. "Decision-Focused Costing at Kenco"
   by James T. Mackey and Vernon H. Hughes 51

Chapters 11 and 12 - Standard Costing

8. "Valuing Production Using Engineered Costs"
   by Richard P. Mager 59
9. "How a Japanese Auto Maker Reduces Costs"
   by Yasuhiro Monden and John Lee 65

Chapter 13 - Absorption and Variable Costing

10. "Customize Your Costing System"
    by Jacci L. Rodgers, S. Mark Comstock, and Karl Pritz 73

Chapter 15 - Relevant Costing

11. "How ABC Can Add Value to Decision Making
    by Linda F. Christensen and Douglas Sharp 77

Chapter 17 - Cost Control for Discretionary Costs
12. "Budgeting and Control of Discretionary Costs"
by Donald W. Ramey 85
13. "Green Dollars and Blue Dollars: The Paradox of Cost Reduction"
by Alfred M. King 93

Chapter 18 - Control of Inventory and Production
14. "The Tools of Just-in-Time"
by Mark C. DeLuzio 103
15. "What Production Managers Really Want to Know ...
Management Accountants Are Failing to Tell Them"
by Sharon M. McKinnon and William J. Bruns, Jr 113

Chapters 19 and 20 - Capital Budgeting
16. "Outside Influences on Capital Budgeting Systems"
by Pamela H. Church and Kenneth R. Lambert 125

Chapter 22 - Measuring Organizational Performance
17. "Numerical Nonsense"
by Robert W. Hall 131

Chapter 23 - Rewarding Performance
18. "Your Paycheck Gets Exciting"
by Shawn Tully 135

STRATEGIC MANAGEMENT ACCOUNTING--WHY AND HOW

By Makoto Kawada and Daniel F. Johnson

Teijin Seiki Co., Ltd., is a diversified manufacturer of machines and machine components for many different industries--heavy equipment, textile, aerospace, robotics, printing, and others--with plants in several locations around Japan. In 1983, one of Teijin Seiki's divisions, which made reduction gears for large earth excavators, had been languishing in red ink for 10 years, ever since its establishment. As a last resort, the plant manager decided to implement drastic reforms to its production systems by introducing just-in-time (JIT), a new production method at that time.

The first accounting step was to stop calculating product costs by using the actual time needed for each individual process. We stopped issuing daily efficiency reports showing standard and actual variances for the previous day. We also banned asking workers what caused efficiency variances. Instead, we made such activities as helping bottleneck work centers digest the overload a top priority.

We understood that actual production activity levels fluctuated with customer orders. We found that dealing with changing work loads is possible when every worker is willing to help out and to move among different work centers without hesitation. The essential ingredients are teamwork, multi-skill capabilities, and a willingness to be flexible.

Individual workers contribute value under this regime when they cooperate with other work centers for the greater efficiency of the whole operation. Whether performing each individual process within the standard time is worthwhile depends on the situation. At a nonbottleneck work center, holding individual performance to a standard is counterproductive. It assesses credit or blame for performing better or worse than standard when neither matters. Cooperation with other departments is far more important at a nonbottleneck. The purpose behind setting standard times is to estimate product costs in advance and to locate the "sweet spots" for cost reduction, but one need not match standard times with actual times for this purpose.

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Freed of bonds to actual time, people began to accept flexible job dispatching. Employees' jobs changed almost daily according to the work load, shattering the illusion that production should follow a division of labor into specialized tasks. As one result, the plant moved from being the "dog" to being one of the stars of the company.

This division was only the first at which Teijin Seiki tried a new production method. During the 1980s the company adopted new production theories and techniques at many sites as they seemed to fit the circumstances. As we did, we quickly saw the need for our management accounting systems to evolve in support. The experiments through which we introduced new accounting concepts to deal with specific needs in different divisions of the company in the end caused us to reconstruct our accounting system entirely. We had to convert it to strategic management accounting.

THE CONCEPT OF TARGET BURDEN RATE

Another of the experiments that introduced a new accounting concept took place at a Teijin Seiki division that makes textile machines and machine components. It introduced a flexible manufacturing system (FMS) in its main factory in 1984. Its managers thought that in-house parts production then would achieve the necessary high quality, low costs, and quick delivery, but getting everyone to go alone was not so easy. Unexpected confusions arose from the product cost calculations.

Suppose the company shifted part of its outside work to in-house operation to take advantage of the FMS--work that takes outsiders 20 hours to process but only 10 hours in-house. Table 1, section A shows how to calculate the comparative conversion costs for in-house and outsourced work in the traditional way.

TABLE 1 / TRADITIONAL VS. NEW COST CALCULATIONS

A. Traditional calculation of in-house and out-sourced conversion costs	
In-house hourly rate	= direct labor plus manufacturing overhead
In-house conversion cost	= hourly rate x processing time = $ 80 x 10 hours = $800
Outside conversion cost	= $ 35 x 20 hours = $700
B. New calculation of in-house conversion costs with target burden rate	
Target hourly rate	= outside manufacturer's level = $ 35
New in-house conversion cost	= target hourly rate x processing time = $ 35 x 10 hours = $350
Allocation residual	= (actual hourly rate − target hourly rate) x processing time = ($80 − $35) x 10 hours = $450
Outside conversion cost	= $35 x 20 hours = $700

This calculation shows that farming the work out is more economical than doing it inside despite the fact that FMS machining time is one-half that of outside sources. This example is a typical make-versus-buy confusion caused by the fully burdened hourly rate of full-absorption costing. The production people who introduced FMS at the plant were frustrated by this cost report. Fortunately, company accountants were flexible enough to reexamine their product costing method.

One accountant proposed that product cost should reflect only variable costs, that is, only direct, out-of-pocket costs, arguing that would clear any deception from otherwise seemingly higher in-house conversion costs. This suggestion, however, gained little support from people who felt fixed costs should be recovered in product costs and the cost differences from a make-versus-buy decision ought to be minimized. At the time, it appeared we had an insolvable dilemma. But a

breakthrough in thinking occurred: the concept of "target burden rate." Table 1, section B, shows the new calculation.

Here is the rationale:

1. We take the burden rate from an external assessment as a yardstick for competitiveness. When outside suppliers--anywhere, domestic or offshore--make a product at an average hourly rate of $35 per hour, then we must do in-house work at the same rate to stay competitive. A $35 hourly rate should be seen as the baseline *to be achieved* either through reducing product costs or cutting fixed costs.

2. The conversion cost under the new target costing method--$35 x 10 = $350 in this case--can be regarded as variable cost (out-of-pocket cost) so that deceptive cost fluctuations with volume changes are removed.

3. The allocation residual of $450 represents the gap between the target rate and the actual rate. We settled it as a fiscal year-end variance. That way, Japan's Taxation Bureau could acknowledge the target burden as a generally accepted accounting concept.

4. Finally, we believe it is important to recognize the $450 residual as a "competitive variance" nothing less than waste (except for depreciation) to be eliminated. The relatively large amount shows that we must set activities in motion promptly to reduce the waste.

Freed from this make-versus-buy confusion, managers and workers began to direct their attention outward, toward the market and their competitors. This company division, forced to lay off employees in the 1980s, by the end of the decade resurged as one of the most competitive manufacturers of synthetic-fiber-producing machines.

LEAD TIME-BASED COSTING

Another problem occurred at the same reduction gear plant mentioned earlier, after signs of recovery gradually began to appear. Product costs there had been calculated using the traditional full costing method, as follows:

Product cost = material + conversion cost
Conversion cost = standard machine time x hourly burden rate
Hourly burden rate = total indirect expense/Σ standard times

Under this formula, cutting standard machine time at any given process point by making a drawing change, for example, would seem to lower the conversion cost. So when a plant-wide quality circle campaign generated many improvement proposals, managers expected great benefits. Results fell far short of expectations, however. Managers asked, "Where have all the savings gone?"

The plant faced another hitch. In developing its material requirements planning (MRP II), guided by the principles of JIT and optimized production technology (OPT), the plant tried to cut the batch size. Increased frequency of setup times due to the smaller lot sizes in practice led to higher unit cost. So we asked, "Which is wrong--the traditional cost accounting or the new production theory?"

A joint effort by the company's production and accounting people produced a breakthrough. They arrived at the concept of lead time-based costing (LTBC). The solution was to adopt lead time instead of standard time as the cost driver. Consider Table 2, section A, which shows lead times and standard times for two parts going through the same three processes. In this example, part A takes 15 minutes in standard time and 30 minutes in lead time, while part B takes 20 minutes in standard time and 24 minutes in lead time. The question is: Which part, A or B, has the lower conversion cost? The answer--with a new formula--is part B costs less than part A. Table 2, section B, presents the new formula.

TABLE 2 / COMPARISON OF LEAD TIMES AND STANDARD TIMES

A. Lead times and standard times in minutes for two parts, A and B, going through three processes, #1, #2, and #3

	Part A				Part B			
Process	#1	#2	#3	Total	#1	#2	#3	Total
ST	2	10	3	15	7	5	8	20
LT	10	10	10	30	8	8	8	24

B. The new formula for lead-time-based costing

Product cost	=	Material cost + conversion cost
Conversion cost	=	*Lead time* x hourly burden rate
Hourly burden rate	=	Total indirect expense ÷ Σ *lead times*

C. The components of the concept of lead time

LEAD TIME

Waiting time (cost adding)	Standard time (value adding)
90%~70%	10%~30%

← a process →

Lead time is the elapsed time for material to go through a plant. It encompasses the conventional standard time of man-hours and machine-hours as well as waiting time, as shown in Table 2, section C. This section also shows that only 10% to 30% of lead time is actual processing time, while 90% to 70% is waiting time in a queue.

The conclusion about conversion costs of parts A and B, based on lead times, is the reverse of costs based on standard times. With the new production method, the longer the lead time the more the overhead that is charged. So the new yardstick for evaluating cost reduction efforts is how much such efforts shorten lead times. One easily can see that process #2 for part A and process #3 for part B are the best spots for cost reduction because for part A, saving one minute at process #2 contributes fully toward shorter lead times for part A. Because process #2 is the bottleneck, total lead time will be cut three minutes to 27 minutes. Whereas trying to save a minute at process #1 or process #3 only wastes effort and money, there would be an increase in work-in-process inventory with no increase in throughput. The same argument applies to process #3 for part B.

Lead time-based costing encourages small batch production. The smaller the batch, the greater the velocity of material flow. Accordingly, the conversion cost should be lower. In this way, LTBC coincides perfectly with new production technologies such as JIT and OPT.

Several rules for lead time-based costing come from optimized production technology, developed by Eli Goldratt as an innovative production system.[1] They are:

- Balance flow, not capacity, to demand.
- An hour saved at a nonbottleneck is a mirage.
- The bottleneck governs both throughput and inventory level.
- The sum of the local optimums is not equal to the global optimum.

These rules provide linkages for repairing the once-fractured relationships between production and accounting. Thus for the future LTBC can become a unifier of production and accounting in other companies as activity-based costing (ABC) has in the 1990s.[2]

Finally, because only 10% to 30% of lead time is spent on value-adding operations that directly convert materials, while the remaining 90% to 70% is for cost-adding waiting time--when flow is interrupted and costs accumulate--it is easier and more effective to cut waiting time than machine time, especially during the early stages of a productivity-improvement program. Traditional accounting nevertheless focused only on the 10% to 30% of lead time. Strategic management accounting treats machine time and waiting time in the same way.

NEW ATTITUDES ABOUT CASH FLOW

Financial cost reports do not necessarily reflect a company's real profitability or productivity. Under the traditional, full-absorption cost accounting method, profit is deceptively high when a company builds inventory and deceptively low when it reduces inventory. After the JIT production method became popular in the 1980s, many companies found it difficult to implement small batch production. Reported profits shrank when inventory fell because of JIT, even though lower inventories were more desirable overall. Despite the defeat of direct costing by full-absorption costing in the 1950s, more managers now are taking a second look at direct costing because its results resemble cash flow.

Teijin Seiki uses cash flow concepts prominently to evaluate the business performance of its decentralized business units. The objective of cash flow tracking is to preclude actions that may enhance short-term return on investment but sacrifice the company's long-term profitability. This idea is not new. Its prototype was introduced in the 1920s by the DuPont Co.[3] Teijin Seiki's internal definition of cash flow is:

Cash flow =
(net profit x tax rate) + depreciation
+ R&D expense

The difference between Teijin Seiki's definition of cash flow and DuPont's is that Teijin Seiki added R&D expenses to the calculation of return to encourage R&D activities. The rationale is that R&D expense is *future* cash-in. No R&D is carried out today without the prospect of future cash-in. GAAP considerations aside, this rule works for our company; it directs behavior as we want.

GETTING ALONG WITH FINANCIAL ACCOUNTING

It is no easy job, even for insiders, to assess business performance objectively. Profit fluctuates in a deceptive manner with fluctuations in inventory, depreciation, and other factors. These profit fluctuations may he exaggerated by the familiar end-of-the-period effect caused by the financial accounting system. At the end of a month the factory is fairly busy and tends to be frightfully busy at the end of a fiscal year. A company's performance is assessed by the financial data issued at the end of accounting periods. Cost variances such as volume and efficiency variances are figured at the fiscal year-end in the financial reports and make virtual profitability all the more obscure.

To cope with this ambiguity, we began to regard each month as the ending month of the fiscal year. We render a yearly income statement for the past 12 months, such as May to April, June to May, July to June,

and so on, rolling every month. Making every month the month of reckoning levels fluctuations due to the end-of-the-period effect. Profitability trends are revealed in the gentle curves that come from moving averages.

Despite problems caused by financial cost accounting, we can use its tools in special ways, such as reporting on a full year every month to see what lies beyond the horizon of the fiscal year.

As you see, our experiments succeeded. We had committed to JIT, OPT, flexible manufacturing systems, and material requirements planning because they were correct for our operations. Through the struggles of many people, we succeeded in turning flagging plants around and generally transforming the company. We learned we simply had to modify or adjust our accounting to reconcile with the strategies our new production technologies embodied. We also tried to understand and place these new ideas in a larger context--an entire framework that would not only prevent clashes between production and accounting but also would introduce new concepts and fit with all the other systems in the company. That framework is strategic management accounting.

KEYS FOR STRATEGIC MANAGEMENT ACCOUNTING

The key requirements for an adequate structure for strategic management accounting are:

- Take a holistic approach, and don't start with less.
- Expand and strengthen externally oriented business processes.
- Do product planning first.
- Functionally integrate production and accounting.

Take a holistic approach, and don't start with less. Many sources agree on this requirement. In 1989. the Massachusetts Institute of Technology Commission on Industrial Productivity stressed the importance of a holistic approach in its Made in America by saying, "Everything we have learned from our industry studies in the United States and abroad suggests that individual parts of the old patterns cannot be replaced piecemeal. It will not do to borrow pieces of the West German or the Japanese systems and try to make them fit an American context. Rather, for any of the reforms to survive and flourish, the environment in which it is implanted must be transformed."[4]

Made in America also pointed out recent U.S. efforts to improve industry relationships that traditionally have been weak, such as between assemblers and suppliers, unions and management, and technical specialists and generalist managers.[5] These efforts suggest that a holistic instead of a parochial approach is necessary.

When the technology shift occurred in manufacturing in the 1980s, it shifted from product-out, make-to-stock, mass production to market-in, make-to-order, small-batch production. Innovative production methods such as JIT and OPT flowed more from synthetic rather than analytic thinking and rejected the idea that the total optimum equals the sum of local optimums.

Despite its status as a fad in the 1970s, JIT has not been applied as widely in Japan as the media tell us. Where it has, it has become obvious that implementing a JIT (or a kanban) system requires a holistic approach: The same rigid principles of material flow must penetrate the entire organization and include outside suppliers. This approach remains quite a challenge for most Japanese manufacturers. Also, clashes

between the new production methods and traditional cost accounting have made shifting methods even more difficult. Many failed introductions of computer-integrated manufacturing (CIM), JIT, OPT, and MRP II were reported in the 1980s. Most failures can be explained by a timid, patchwork-style, incremental approach instead of an approach that challenges the whole organization at once with a big-plan-yet-small-start approach.

No matter how big or small the business, accounting strategists in the end must thoroughly integrate all management functions. At the outset, invest the essential missions of each function with the viewpoint that they are in global competition in a global market. Make sure that both strategies and tactics have the same consistent aim and a balance of long-term and short-term goals.

Expand and strengthen externally oriented business processes. In the model proposed by R.N. Anthony in his Planning and Control Systems in 1965, the only externally oriented business process was financial accounting.[6] For an accounting strategist, on the other hand, external orientation means "environmental information control" in general. In globally turbulent times, it is critical that businesses sense changes and trends in technologies, markets, and competition. Externally oriented business processes will function as brokers of external information. They will guide and direct internally oriented processes by gathering, interpreting, and arranging such information as internal process managers require.

Do product planning first. In traditional management accounting and in Anthony's model, profit planning for the current period took precedence over product planning. General management tasks such as financial policy decision making, budgeting, and staff planning came before production tasks such as choosing new products, changing equipment layout, and measuring performance. Perhaps when Anthony was writing, America's industrial world dominance made the sequence of plans and decisions unimportant. Especially now, however, that order must be reversed because product life cycles are so short and volatile.

Do product planning first because the product and the technology for producing it are the very core and substance that define an industry. That core and substance must be built into the architecture of strategic management accounting. Otherwise, any delusions of general management will obscure the core issues.

General managers in the United States have been distracted from core issues by many management fads and fashions: fancy management information systems (trying to let the computer run the business); overblown operations research (trying for a mathematical solution); self-limiting Keynesian economic policy (trying to control economic growth through fiscal and monetary adjustments); flirting with the concept of the multinational corporation and psychological approaches such as the managerial grid and theory Y (which seem remote from adding value); and the rage for mergers and acquisitions in the 1980s. All are general management-level concerns and divert the strategist from the core issues.

Japanese managers, on the other hand, seem fixated on execution, with questions about how to make things. They lack any accountability for general, overarching questions. The best approach may be a marriage of the two, rather than one or the other.

Functionally integrate production and accounting. The history of 20th century accounting is replete with conflicts and controversies of many different kinds. One is the virtual chasm between budget control and production control. Budget control is linked to the double-entry bookkeeping system of financial accounting, while production control is based on nonmonetary yardsticks for individual production tasks. Atsuo Tsuji,

then a professor at Osaka City University, described the differences in the 1970s, called them a chasm, and dealt with them in a model he called "from the engineer's accounting to the accountant's accounting."[7]

H.T. Johnson and R.S. Kaplan, in their 1987 book *Relevance Lost*, pointed out the problems with traditional cost accounting. Logical problems and production problems were caused by allocating indirect costs in two tiers: to products according to a single, volume-oriented cost driver and to cost centers according to other factors such as floor space, machine capacity, equipment maintenance, and additional factors that themselves also varied with obsolescence, depreciation, and other intangibles-a confusing state of affairs that led to creating so-called "nonfinancial indicators."[8]

Tsuji's chasm eventually led to irreconcilable confrontations between production and accounting. New production methods such as JIT and OPT encouraged small batch production. But under conventional costing systems-based on a single, volume-oriented cost driver such as direct labor time-the smaller the batch size, the higher the product cost because more frequent machine setups required more time. It is no wonder, then, that Goldratt, the originator of OPT, said, "Accounting is one hundred percent the enemy of productivity."[9]

HOW TO ACHIEVE FUNCTIONAL INTEGRATION

Two schools of management accounting thought are trying to promote better working relations between production and accounting. One, the accuracy school, is trying to improve the accuracy of product costs. The other, the strategy school, is pursuing what may be called strategic relevance rather than accuracy. The trait they share is their disdain for traditional financial cost accounting. They both say that financial cost accounting undermines productivity and that the only road to a workable management accounting is to sever ties between financial accounting and production control--for now.

Arguing for the accuracy school, Kaplan insists that allocating indirect costs is what causes product cost distortions. He says we should regard all costs, except for a few such as R & D expenses, as variable costs. Moreover, nonfinancial indicators should direct productivity improvements instead of financial data.[10] The accuracy school developed activity-based costing (ABC). In ABC, both volume-sensitive and nonvolume-sensitive real overhead cost drivers are identified, and indirect costs are traced to them. Thus, highly accurate product costs are achieved.

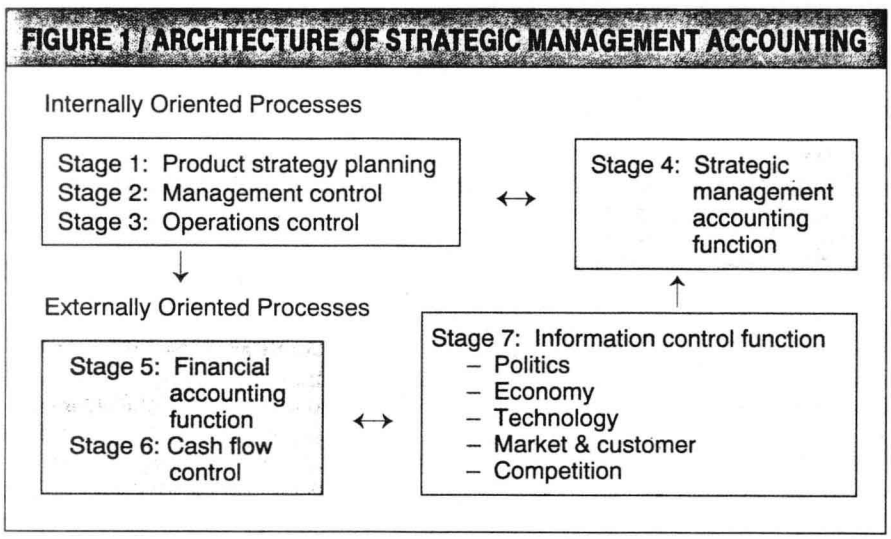
In strategic management accounting, cost drivers are not derived from calculations of intracompany information. Cost drivers from a strategic viewpoint are those things that determine competitive advantage. The direction of the flow of thinking--from the outside business environment to management inside--stands in striking contrast to that of the accuracy school, which goes from inside management to the outside environment. Earlier, we described how Teijin Seiki adopted the concept of target burden rate. We identified it as a determiner of competitive advantage, what is called a critical success factor.

To prevent logical and functional problems, as strategists we must clarify the role and place of financial accounting in the overall strategic management accounting framework. Used properly, financial accounting information can be relevant to strategic decisions. Obviously, companies must keep score financially and report it to concerned outside parties. So, we must coexist peacefully with financial accounting we must put it in its proper place in our management systems, not reject it. Without doubt or hesitation, let us expel financial accounting from the production sphere. There is no room in strategic management accounting for cohabitation between production and financial accounting. But coexistence

without cohabitation can be achieved by sending the information in only one direction--from internal sources to external receivers. For any strategic management accounting system to work, financial accounting should receive information from, not send it to, the sphere of operations management.

THE ARCHITECTURE OF STRATEGIC MANAGEMENT ACCOUNTING

We define strategic management accounting as a method of adapting management plans by accounting devices for the purpose of adapting the company effectively to the constantly changing external business environment. The architecture of effective strategic management accounting is presented in Figure 1. In some ways, this architecture is only an update of Anthony's framework. Figure 1 shows the functions to be encompassed, how they relate to each other, and the stages of integration. Internally oriented processes consist of the production functions, from design to distribution, in three stages. After these three stages, the strategic management accounting system can be pulled in. Then come the externally oriented processes consisting of two stages, followed by the information control function.



In building a strategic management accounting system we at Teijin Seiki found it important to follow a particular sequence of steps. We look from the external business world toward the internal world of the company. With us it is an ironclad rule to start as the first step with a complete scan and survey of changes in the external business environment, including regulation, the economy, resource availability, technology, competition, the market, and so on. Next, as the second step, we specify and define the critical success factors. For example, the market may be more customer oriented, so the critical success factor may be "quality through speed," in other words, the highest possible quality in the shortest possible cycle time.

Then, only after defining the critical success factors, we devise relevant accounting devices and procedures as the third step-in this case to encourage cutting cycle time while keeping quality high. In this way, development always flows from external signals to internal responses, never the other way around. To reiterate the rules:

External signals ⇒ Internal responses
Step 1: Scan the environment.
Step 2: Specify CSFs.
Step 3: Assemble accounting apparatus.