Eastern Economy Edition

ADVANCED MANAGEMENT ACCOUNTING

THIRD EDITION

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Preface

Advanced Management Accounting, third edition, is a major revision from the second edition that was published in 1989. In the preface for the second edition, we were already describing the enormous changes underway for both manufacturing and service operations, and highlighting the rapid evolution in the technology for information processing. These advances created a challenging new environment for management accounting systems. If anything, rapid changes in the theory and practice of management accounting during the past ten years have accelerated, and to keep pace we have introduced significant new coverage and deleted some older material as we wrote the third edition.

The role for management accounting continues to undergo major changes. Management accountants are no longer only scorekeepers of past performance. They have become value-adding members of management teams, creating information vital for enhancing operational excellence, and for formulating and implementing new strategies. A significant development in this new role is a great increase in the importance and use of nonfinancial measures of performance. This book provides extensive coverage of the new management accounting practices being adopted by innovative companies around the world, including activity-based costing, kaizen and target costing, and the Balanced Scorecard.

A research project sponsored by the Institute of Management Accountants and the Financial Executives Institute[1] surveyed U.S. corporate accounting and financial executives about the relative importance of various accounting knowledge and skill areas (AKSAs), and about the extent to which entry-level accountants bring these AKSAs to their initial job. The four AKSAs rated as most important for management accountants were budgeting, product and service costing, control and performance evaluation, and strategic cost management, including activity-based costing. These four AKSAs, how-

[1] *What Corporate America Wants in Entry-Level Accountants* (Institute of Mangement Accountants: Montvale, NJ: 1994).

ever, also showed the largest gap between corporate expectations and actual preparation of entry-level accountants. In this third edition, we provide comprehensive treatments of these four highly rated AKSAs.

The book's introduction, surveys the rich historical role for management accounting in the development of large industrial and service enterprises. Chapter 1 provides a comprehensive summary of cost definitions and cost classifications. It uses a comprehensive example to illustrate how traditional notions of fixed and variable costs can be imbedded in a much richer framework of committed and flexible costs. The chapter treats committed costs as arising from managerial decisions to supply capacity to perform anticipated work. It introduces the vital distinction between the costs of resources supplied versus the costs of resources used. It also examines the importance of identifying sustaining costs, at various hierarchical levels and decision points, where managers have the opportunity to make long-term decisions about whether to introduce or continue to support products, lines of business, customers, channels, and market segments. Chapter 2 builds on this framework to address short-term budgeting and decision making with the existing supply of resources. This chapter provides a comprehensive model for short-term budgeting and for optimizing the use of short-term committed resources.

Chapter 3 draws heavily on the treatment of service department costs from the first and second editions, but imbeds this subject in the context of a general treatment of cost system design. Thus, we view the assignment of service and support department costs as the initial assignment stage, from resources to production cost centers, when designing cost systems for operational control and for product and service costing. Chapter 4 extends this framework and introduces activity-based costing, allowing resource costs to flow, not just to production cost centers, but to activities. The chapter builds on this activity framework, to provide a comprehensive introduction to activity-based costing (ABC). It shows how to use a range of different types of activity cost drivers to assign resource costs more accurately to cost objects: products, services and customers. The chapter concludes by summarizing the principal benefits and design trade-offs associated with introducing an activity-based cost system.

Chapter 5, Activity-Based Management (ABM), incorporates material from the pricing chapter in the second edition, and extends this material by describing a full range of strategic and operational decisions that are better informed by the more accurate information drawn from an ABC system. ABM actions include, in addition to re-pricing, decisions about product and customer mix, product design, process improvements, operations strategy, and technology investments. Chapter 6 addresses operational ABM for process improvements and discusses the roles of kaizen costing in continuous improvement, and target costing for influencing future product costs at the design stage.

In summary, we use the conceptual framework of activity-based costing to provide an integrated treatment for these first six chapters. Chapters 1, 4, 5, and 6 are virtually completely new material for *Advanced Management Accounting*, third edition, and Chapters 2 and 3 have been re-written, from the second edition, to fit within this integrated framework.

To accommodate all this new material, we eliminated the two chapters on regression analysis, which were a central feature of the first two editions. The deletion decision was strongly influenced by the theoretical advance that statistical analyses can measure only the results of management decisions (how much capacity to provide, and how

quickly managers adjust resource capacity to changes in the demands for resources). Of more relevance for managers is not estimates of the cost of supplying resources, but the cost of the actual demands (the costs of resources used) that activities make on most organizational resources. This role is now accomplished through ABC systems, not statistical analysis. We have also deleted the chapter on joint costs, recognizing that this issue is more a cost accounting topic (for inventory valuation) rather than one that facilitates managerial decision-making and control. And the linear programming section from the second edition has been replaced by Excel's Solver algorithm used to solve the short-term resource allocation example in Chapter 2.

Chapter 7, Decentralization, introduces the second half of the book. Rewritten slightly from the second edition to reflect the impact of ABC and the Balance Scorecard, this chapter remains highly relevant for communicating the challenges of motivating, controlling, and evaluating decentralized organizational units. Chapter 8, the Balanced Scorecard, provides a new comprehensive framework for strategic and operational control. The chapter summarizes the advances in the 1990s of translating strategy into an integrated set of financial and non-financial performance measures tied to customers, innovation and operational processes, and enhanced employee and system capabilities.

Chapters 9 and 10, on profit centers and investment centers, are drawn from the second edition, but repositioned in the third edition to portray the measures for the financial perspective of the Balanced Scorecard. In a major semantic change, the residual income approach, described in the first two editions, has been updated to reflect the surge in interest and application of economic value added. Chapter 11, an enhanced version of the quality and just-in-time chapters in the second edition, summarizes the expanded measurement possibilities from the other three Balanced Scorecard perspectives. It includes quality and cycle time operational measures, but it adds the vitally important measures relating to customer outcomes, the value propositions required to succeed with targeted customers, product and service development, and measures of employee and system capabilities.

Chapter 12, Investments in New Technologies, expands on the second edition's coverage of investment possibilities to include enhanced organizational capabilities. Thus, what had previously been a stand-alone chapter on advanced capital budgeting has now become integrated in the management control framework. Investment decisions are made to achieve outstanding performance in the critical, strategic measures in the four Balanced Scorecard perspectives. Financial payoffs remain important, but investment payoffs also include enhanced performance for customers, for critical internal processes, and for enhancing organizational capabilities.

Chapters 13 and 14, on incentive compensation plans and on formal models for budgeting and incentives, draw from the comparable chapters in the second edition. They have been updated to incorporate new insights from recent research and experience. They also develop the frictions that arise in conventional contract theory research in a more detailed and intuitive manner.

Each chapter, with the possible exception of Chapter 14, contains material that is immediately applicable to contemporary organizations and that has been, in fact, already successfully put to work in practice. Our extensive use of case material reinforces this emphasis on practice in actual organizations. Moreover, we have selected assignment material to illustrate how the concepts in each chapter have been or can be applied not just in somewhat mechanical and idealized situations, but in the context of actual business

situations. There may be no simple answers to some of the cases we present, but we believe they will help students come to understand and be able to apply the relevant concepts in the actual organizations they will encounter after leaving the academic setting.

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Introduction

Management accounting systems provide information to assist managers in their planning and control activities. Management accounting activities include collecting, classifying, processing, analyzing, and reporting information to managers. Unlike the financial accounting information prepared for external constituencies, such as investors, creditors, suppliers, and tax and regulatory authorities, management accounting information should be designed to help decision making *within* the firm. Therefore, the scope of management accounting extends beyond traditional measures of the costs and revenues from the transactions that have already occurred to include also information on sales backlogs, unit quantities, prices, demands on capacity resources, and extensive performance measures based on physical or nonfinancial measures.

Because the information to aid internal planning and control activities is not constrained by external reporting requirements, the management accounting system can use data that are less objective and less verifiable than the data used in the financial accounting system. Greater use can be made of future-oriented data such as forecasts and estimates, as well as measures of opportunity costs from transactions not taken. Ultimately, the test of a management accounting system is whether it motivates and assists managers in attaining their organizational objectives in a timely, efficient, and effective manner. Relevance is valued more than objectivity and auditability, though whatever data are used must be defensible and transparent to organizational participants.

ORIGINS OF COST MANAGEMENT SYSTEMS[1]

Accounts of the operations of the guilds in medieval England suggest that guild members used detailed information about the cost of materials and labor to certify product quality to prospective customers. But before the nineteenth century, organizations conducted virtually all of their transactions with other independent entities to perform individual functions in the manufacturing process. When the bulk of transactions are carried out with entities external to the firm, and few long-term investments are made within the firm, the financial accounting system—the official recorder of such transactions—provides sufficient information to assess the efficiency and profitability of the enterprise.

The origins of modern management accounting can be traced to the emergence of managed, hierarchical enterprises in the early nineteenth century, such as armories and textile mills.[2] These enterprises were formed to conduct an entire multistage production process within a single organization. The organizations took advantage of the economies of scale from relatively capital-intensive processes to hire groups of workers who manufactured the firm's output. Frequently, the manufacturing facility or factory was located next to a readily available energy source, such as rapidly running water, geographically separated from the urban home office of the owners. Information was needed to replace information formerly available from market transactions so that the efficiency of internal production processes could be measured as products moved internally from stage to stage. Also, the home office wanted an information system to motivate the managers at the remote factory site and to judge the efficiency of the managers and workers at the factory. Thus, for a textile mill, internal measures were developed on cost per yard or cost per pound in the separate processes of carding, spinning, weaving, and blanching fabrics.

Perhaps the largest force for developing management accounting systems came from the emergence and rapid growth of the railroads in the mid-nineteenth century. Railroads were the largest and most complex organizations yet created by human beings, with operations having to be conducted and coordinated over vast geographical distances. Fortunately, the telegraph was invented at roughly the same time, and it provided the capability for rapid, inexpensive communication across these vast distances. Innovative railroad managers developed sophisticated approaches to handle the financial transactions required by their extensive operations. New measures such as cost per gross ton mile, cost per passenger mile, and the operating ratio (the ratio of operating expenses to revenues) were developed to help managers evaluate the efficiency of their operating processes.

Many of the innovative management accounting ideas developed by railroad managers were subsequently adopted and extended by the managers of companies in the steel industry. Andrew Carnegie, in particular, was known for having an obsession with knowing his costs and with continually attempting to improve his cost structure relative to competitors:

> Each department listed the amount and cost of materials and labor used on each order as it passed through the subunit. Such information [was used to prepare] monthly statements and, in time, even daily ones providing data on the costs of ore, limestone, coal, coke, pig iron, spiegel, molds, refractories, repairs, fuel and labor for each ton of rails produced. . . .
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> These cost sheets were Carnegie's primary instrument of control. Costs were Carnegie's obsession. . . . He was forever asking [department heads] the reasons for

> changes in unit costs. Carnegie concentrated . . . on the cost side of the operating ratio, comparing current costs of each operating unit with those of previous months and, where possible, with those of other enterprises. . . . Indeed, one reason Carnegie joined the Bessemer pool . . . was to have the opportunity to get a look at the cost figures of his competitors. These controls were effective. . . . The minutest detail of cost of materials and labor in every department appeared from day to day and week to week in the accounts; and soon every man about the place was made to realize it. The men felt and often remarked that the eyes of the company were always on them through the books.
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> In addition to using the cost sheets to evaluate the performance of department managers, foremen and men, Carnegie [and his general managers] relied on them to check the quality and mix of raw materials. They used them to evaluate improvements in process and in product and to make decisions on developing by-products. In pricing, particularly nonstandardized items like bridges, cost-sheets were invaluable.[3]

Large merchandisers, such as Sears-Roebuck, Marshall Field, and Woolworth, developed in the late nineteenth century to take advantage of the economies of scale from mass distribution of consumer products. These enterprises also needed measures to assess the efficiency of their internal operations. Traditional manufacturing measures, such as cost per pound or cost per mile, were not relevant for the purchasing, stocking, and selling activities of retail organizations. Instead, these companies used measures such as gross margin (sales revenues less purchases and operating costs) and the stock-turn ratio (the ratio of sales to inventory level) to measure the profitability and speed with which purchased merchandise became converted to sales.

In all these examples—textile mills, railroads, steel mills, and retail distributors—managers were developing measures to motivate and assess the efficiency of internal operating processes. There was little concern with measuring the costs of different products or even the periodic "profit" of the enterprise. These organizations had only to process their relatively homogeneous products efficiently: Convert raw materials into a single final product such as cloth or steel, move passengers or freight, or resell purchased goods. If the basic activity were performed efficiently, the managers believed that the enterprise would be profitable. The measures developed were specific to the type of product and process of the organization but had one common characteristic; they measured the efficiency by which input resources were converted to finished products or sales revenue. Even though the production processes of these organizations were quite complex, involving multiple stages of conversion and processing, the organizations had a narrow product focus that enabled them to use simple summaries of output. Textile mills produced yards of fabric, railroads produced gross-ton miles of freight moved, steel mills produced tons of steel, and retailers produced, simply, revenue dollars. Therefore, product costs could be obtained with the same measures used to motivate and evaluate efficient operating processes.

THE SCIENTIFIC MANAGEMENT MOVEMENT

Complex metal-machining companies, emerging in the mid-nineteenth century, introduced a new set of challenges for management accounting systems. Metal-forming and metal-cutting shops produced a wide variety of finished products, and the different products consumed resources at widely different rates. Because of the dispersion in demands

that the various output products made on the firm's capital, labor, and support resources, simple measures of cost per pound or cost per unit of output were not adequate to summarize the efficiency of the conversion processes. Although an early version of job-order costing could capture actual material and labor costs, such costs would not include the cost of capital resources used to bend, form, and cut the metal, and no standards or even historical trends existed to determine whether the costs actually incurred represented efficient operations.

This void was addressed by a group of mechanical engineers who founded the **scientific management** movement. Frederick Taylor is the best known of this group, but many other individuals played an active role in developing this important new field. The scientific management engineers studied work processes closely in order to redesign material and work flow and to decompose complex processes into a sequence of simpler and more controllable processes. The goals were to simplify the work, make the workers more efficient, and be able to monitor the workers' efforts. Detailed and accurate standards for material and labor usage were developed to control work and to pay workers on a "scientifically determined" piecework basis.

Frederick Taylor was primarily interested in worker efficiency, and he relied heavily on quantity standards for the amount of labor and material that should be used under ideal conditions. Others were more interested in evaluating the commercial (financial) success of the enterprise, not just maximizing the efficiency of individual workers. These engineers and accountants extended the quantity standards of the scientific management engineers to include, as well, a labor cost per hour and a material cost per unit so that labor and material cost standards could be developed for production processes. In this way, the standard material and labor cost of products could be predicted and subsequently compared with the costs actually incurred. By the first decade of the twentieth century, sophisticated systems to record and analyze the variances of actual from standard costs had already been articulated.

Before the advent of metal-working shops and the scientific management movement, management accounting systems had focused on directly measured costs, such as material and labor, that could easily be traced to the output product. Although overhead and capital costs existed in all organizations, the narrow product lines of early manufacturing corporations created little demand to attempt to assign indirect costs to output products. Managers focused on the efficiency with which direct labor and material were consumed in the conversion operations, and they assumed that adequate profits would be produced if such efficiencies were achieved. Also, with focused single-product, processlike organizations, it was easy to get summary measures of total cost per unit of output.

The metal-working shops, however, had both high product diversity and relatively high indirect or support costs. Their engineers and managers searched for ways to assign overhead costs to products, especially when bidding on new jobs. Because information collection and processing costs were quite high a century ago, and overhead costs were still less important than direct material and labor costs, it was not deemed worthwhile to invest large amounts of energy and resources to accurately measure and assign indirect and support department costs to products. Simple rules were adopted, such as marking up direct labor hours or dollars by a percentage that reflected the ratio of indirect and support department expenses (i.e., the overhead costs) to anticipated direct labor quantities. This

procedure was inexpensive because direct labor was already being measured both to monitor the efficiency of individual workers and to pay them. Thus, the practice of applying overhead to products on the basis of their direct labor content had its origins in the labor-intensive production processes of a century ago.

This shortcut, or approximation, of attributing the consumption of overhead resources to the quantity of direct labor in a product was criticized even at the time:

> We find that as against $100 direct wages on order, we have an indirect expenditure of $59, or in other terms, our shop establishment charges are 59 percent of direct wages in that shop for the period in question. This is, of course, very simple. It is also as usually worked out very inexact. It is true that as regards the output of the shop as a whole a fair idea is obtained of the general cost of the work. . . . And in the case of a shop with machines all of a size and kind, performing practically identical operations by means of a fairly average wages rate, it is not alarmingly incorrect.
>
> If, however, we apply this method to a shop in which large and small machines, highly paid and cheap labor, heavy castings and small parts, are all in operation together, then the result, unless measures are taken to supplement it, is no longer trustworthy.[4]

Attempts, however, to use machine hours, multiple labor rates, or material quantities as alternative bases for allocating overhead proved unsuccessful, probably because of the added expense of measuring all these new bases. Machines did not have to be paid for their work, so the only reason for measuring and recording machine hours would have been for a more accurate assignment of overhead costs to products. Apparently, the benefits of more-accurate overhead allocations must have been well below the cost of such supplementary measurement, because the practice did not persist in discrete part production processes. The assignment of overhead costs to products on the basis of machine time, however, had been extensively used in process industries—such as chemicals, glass, and petroleum—in which labor costs were relatively small and processing times had to be measured in order to control the physical conversion process.

A second concern was the treatment of unused capacity costs. H. L. Gantt, a contemporary of Frederick Taylor, addressed his concerns, first dealing with how many allocation bases should be used but then focusing on the assignment of costs to actual output produced:[5]

> There are in common use several methods of distributing [indirect] expense. One is to distribute the total indirect expense . . . according to the direct labor. Another is to distribute a portion of this expense according to direct labor, and a portion according to machine hours. Other methods distribute a certain amount of this expense on the material used, etc. Most of these methods contemplate the distribution of *all* of the indirect expense of the manufacturing plant, however much it may be, on the output produced, no matter how small it is.
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> If the factory is running at its full, or normal, capacity, this time of indirect expense per unit of product is usually small. If the factory is running at only a fraction of its capacity, say one-half, and turning out only one-half of its normal product, there is but little change in the total amount of this indirect expense, all of which must now be distributed over half as much product as previously, each unit of product thereby being obliged to bear approximately twice as much expense as previously.
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> When times are good, . . . this method of accounting indicates that our costs are low, but when times become bad and business is slack, it indicates high costs due to the

> increased proportion of burden each unit has to bear. . . . In other words, our present systems of cost accounting go to pieces when they are most needed. This being the case, many of us have felt for a long time that there was something radically wrong with the present theories on the subject.

Gantt concluded that to fix this problem

> the indirect expense chargeable to the output of a factory should bear the same ratio to the indirect expense necessary to run the factory at normal capacity as the output in question bears to the normal output of the factory.

Gantt's arguments for basing cost driver rates using normal or practical capacity, unfortunately, fell on largely deaf ears, as did his and others' arguments to use multiple cost drivers that would be more representative of the underlying production process. As we will see, the energy and insight from engineers in the scientific management movement were made subservient to simplicity and to the desire, for financial reporting, to allocate all-period factory costs to the products produced during that period. Only a few companies attempted to measure and report on the cost of idle capacity.

MANAGEMENT CONTROL FOR DIVERSIFIED ORGANIZATIONS

Further innovations in management accounting systems occurred in the early decades of the twentieth century to support the growth of multiactivity, diversified corporations. The DuPont Powder Company, established in 1903 as a combination of previously separate family-run or independent companies, provided the prototype for this new organizational form. The managers of the new DuPont Company faced the problems of coordinating the diverse activities of a vertically integrated manufacturing and marketing organization and of deciding on the most profitable allocation of capital to a variety of activities. DuPont was one of the first entities to have to decide which of several diverse operations should be expanded, not just the appropriate scale of operation for processing a single type of product.

Several important operating and budgeting activities were devised by the senior managers of DuPont to coordinate the activities of and allocate resources to their many operating groups. But the most important and enduring management accounting innovation was the return-on-investment (ROI) measure. The ROI provided an overall measure of the commercial success of each operating unit and of the entire organization. Senior managers used the ROI to help direct the allocation of capital to the most profitable divisions. Donaldson Brown, the chief financial officer, showed how the ROI formula could be decomposed into a product of two efficiency measures—the operating ratio (net income divided by sales) and stock turn (sales divided by assets)—developed and used by nineteenth-century single-activity enterprises. Each of these ratios could be decomposed further (see the discussion in Chapter 10) into the income, expense, asset, and liability accounts under the responsibility of local decentralized managers.

Use of the ROI measure was expanded in the 1920s as the multidivisional form of organization evolved in the DuPont and General Motors corporations.[6] The decentralized multidivisional corporation developed to capture economies of scope—the gains from sharing common organizational functions across a broad spectrum of related products.

But the enormous diversity in the product markets served by these giant corporations demanded new systems and measures to coordinate dispersed and decentralized activities. Division managers became responsible for the profitability and return on capital employed by their divisions and had authority to generate capital requests. Corporate-level departments of marketing, purchasing, and finance could not possibly have all the requisite information to function effectively or efficiently in all the markets served by their organizations. Decentralization was necessary, and central managers' functions shifted to running an efficient internal capital and labor market for the organization and to coordinating, motivating, and evaluating the performance of their divisional managers. The ROI measure played a vital role in permitting the internal markets for managers and capital to function. An impressive array of budgeting and forecasting procedures was also developed to plan and coordinate divisional operations.[7]

In retrospect, the 100-year period from 1825 to 1925 saw the emergence and growth of both giant, successful industrial enterprises and a host of management accounting practices. These two phenomena were not independent of each other. In fact, organizations of the size of DuPont, General Motors, or United States Steel were unlikely to have survived without extensive management accounting systems to provide information on the efficiency and effectiveness of their decentralized operations. Technology innovation in transportation (the railroad), communication (telegraph, telephone) and basic processes (for steel, aluminum, metal cutting and forming, machine tools, chemicals, and the internal combustion engine, among many others) created a demand for large enterprises to capture the potential gains from economies of scale and scope. But these gains would not have been realized had there not been simultaneous innovation in measurement systems. These systems communicated corporate goals clearly to decentralized managers and provided feedback on the efficiency of operations managed within the hierarchy of the corporations. Such information was especially valuable for organizations that integrated vertically back to raw materials acquisition and forward to direct delivery to consumers of their products.

FROM COST MANAGEMENT TO COST ACCOUNTING

The next sixty years, from 1925 to 1985, were not nearly as productive in the development of management accounting procedures. The exact reasons for the slowdown, even halt, of management accounting innovation are still being debated. But at least part of the reason appears to lie in the demand for product cost information for financial accounting reports. The procedures for valuing inventory for financial reports were executed in an efficient manner. Indirect or support department costs were aggregated into large, plantwide cost pools and were allocated to products using simple and available measures of activity—typically direct-labor hours. The concerns expressed earlier in the century, by engineers such as Church and Gantt, about attempting to be more accurate in cost assignment to individual products were not heeded.

In principle, there was no particular reason why the greatly increased demand for published, objective, audited financial statements, and the increased regulations on the procedures used to prepare those statements, should have had any impact on the development of management accounting systems. Companies could have continued to refine their

internal measurement techniques to provide independent and more accurate estimates of individual product costs and timely information on operating performance. Separate financial and management accounting staffs have persisted in companies located in German-speaking countries. For many companies in these countries, financial and cost systems are run independently, with a reconciliation module provided to articulate between the two sets of statements at the end of the year when financial statements are prepared. But most Western companies seem to have decided, early in the century when information costs were high and product line diversity was low, that the benefits of keeping two sets of books—one for external parties and one for internal management decisions—were too costly relative to the benefits.

The high cost of information collecting, processing, and reporting coupled with the relatively low distortion for companies with homogeneous product lines led companies to attempt to manage their internal operations with the same information used to report to external constituencies. Thus, product costs were computed on the basis of aggregate, average allocations of manufacturing overhead, and control procedures used monthly variances computed from general ledger financial accounts.

RECENT DEVELOPMENTS IN MANUFACTURING AND SERVICE COMPANIES

During the 1980s, major new challenges emerged for management accounting. Companies rediscovered the critical role that manufacturing plays in creating a competitive advantage for their organizations. Examples of the new emphasis on manufacturing operations could be found in the commitment to quality in manufacturing and in product design, in the reduction of inventory levels and manufacturing lead times (as represented by just-in-time production and distribution systems), and by the introduction of computer-controlled manufacturing operations (the CIM, or computer-integrated-manufacturing environment). All of the manufacturing innovations stressed continuous improvement activities: the need to constantly improve operating processes from the levels achieved in prior years.

These new (or, in some cases, rediscovered) manufacturing technologies were different from the stable manufacturing environment of mass production of standardized products for the first seven decades of the twentieth century. In the new environment, many companies found that their traditional cost accounting measures were inhibiting the introduction of innovative manufacturing processes and technologies. For example, measures of individual worker efficiency or machine utilization conflicted with factory goals to improve quality, increase throughput, and reduce inventory levels.[8] Attempting to absorb factory overhead into products by producing items well in advance of when they are needed does absorb fixed manufacturing overhead into inventory and does create increases in reported period income (because of favorable volume variances that shift current operating expenses in future periods), but the practice undermines the company's efforts to reduce inventory levels, eliminate manufacturing defects, speed throughput times, and improve responsiveness to customers.

Today's management accounting systems must be designed to support, not to inhibit, the drive for manufacturing excellence. Measurement systems must evolve to sup-

port efforts to increase quality and productivity, move to just-in-time and computer-integrated-manufacturing production systems, and help justify investment in new technologies. These issues are discussed in Chapters 6, 11, and 12.

Our discussion may, at a superficial level, appear to focus exclusively on manufacturing rather than service organizations. Discussions on inventory and manufacturing processes might seem of little relevance to managers in financial service, transportation, health-care, retailing, and telecommunications companies. The extensive use of manufacturing terms should not cause readers interested in service industries to ignore the fundamental messages in this chapter and in the remainder of the book. The distinctions between manufacturing and service industries are not critical for the design of effective management accounting systems. About the only substantive difference between manufacturing and service companies arises from the financial accounting demand on manufacturing companies to allocate periodic production costs to items produced but not yet sold.

Managers in service companies, however, have historically used management accounting information far less intensively than managers in manufacturing companies. Service company managers did use financial information to budget and control spending in their functional departments. But even though service companies are frequently as complex and diversified as manufacturing companies, managers usually knew neither the costs of the services they produced and delivered nor the costs of serving different types of customers. All service industries have products that they produce and deliver to customers; the product may be only a little more difficult to define than it is in a manufacturing organization. The products of service organizations have costs that must be understood and analyzed for a wide variety of planning and control decisions. Capacity costing is critical for service companies because virtually all of their spending is related to providing a capacity to serve customers; very few expenses are variable in the short term with services delivered and customers served.

For performance measurement, employees in service companies have more direct contact with customers than do front-line employees in manufacturing companies. Thus, service companies must be especially sensitive to the timeliness and the quality of the service their employees provide to their customers. Customers of service companies immediately notice defects and delays in service delivery. And the consequences from such defects can be severe as dissatisfied customers choose alternative suppliers after an unhappy experience.

CONTEMPORARY MANAGEMENT ACCOUNTING DEVELOPMENTS

Since the 1980s, academics and companies have been developing new management accounting procedures to meet the challenges of deregulated industries and vigorous global competition. These new procedures are designed to support rapidly changing technologies and new management processes—such as total quality management; just-in-time supply, production, and distribution systems; and reengineering—and a never-ending search for competitive advantage.

The modern approach of viewing management accounting as reporting on the costs of committed and flexible resources is introduced in Chapter 1. Chapter 2 features the role

of cost and resource information for short-term decisions that optimize product mix and for performing near-term cash budgeting. Chapter 3 introduces the structure of cost systems by showing how the costs of indirect and support resources can be assigned to production cost centers. This approach is extended by the activity-based costing approach introduced in Chapter 4, which allows resource costs to be traced to activities and subsequently to products, services, and customers. Chapter 5 shows how improved information about products and customers enables managers to make better decisions about pricing, product mix, product design, and customer relationships. Chapter 6 illustrates how activity-based information can be used to motivate performance improvement; it also features operational control systems that provide timely feedback, using both financial and nonfinancial measures for learning and improvement as well as target and life cycle costing, to influence and manage costs over a product's entire life cycle.

The remainder of the book focuses on control of complex, decentralized organizations, a topic introduced in Chapter 7. Balanced scorecards that deploy both financial and nonfinancial measures to link current decisions and actions to long-term financial benefits are discussed in Chapter 8. The financial measures for performance evaluation are discussed in Chapters 9 and 10. Nonfinancial measures for customer and internal business processes are discussed in Chapter 11. Chapter 12 describes how capital budgeting systems can be adapted to stress the development of organizational capabilities, not just simple net present value cash flow calculations. Chapter 13 features the role for managerial compensation systems to motivate performance aligned with overall company objectives. The book concludes with Chapter 14 on the role for formal models to study important management accounting phenomena, such as budgeting, control systems, and compensation.

The book, in total, provides a comprehensive view of the current state of management accounting. Traditional, but still valuable, material has been embedded in contemporary theory and applications. And much new material has been introduced and made available for study, debate, and learning.

SUMMARY

Management accounting systems play a vital role in helping the managers of complex, hierarchical organizations to plan and control their operations. A superb management accounting system may not guarantee competitive success, particularly if companies do not have good products, efficient operating processes, or effective marketing and sales activities. But an ineffective management accounting system, producing delayed, distorted, or too highly aggregated information, can easily undermine the efforts of companies with excellent research and development, production, and marketing activities. The challenge is to develop management accounting practices that support the basic managerial tasks of organizing, planning, and controlling operations to achieve excellence throughout the organization. The management accounting system cannot be viewed as a system designed by accountants for accountants. The 100-year history from 1825 to 1925 provides evidence on the necessity for parallel development of new management accounting practices to support the company's innovations in production, marketing, and organizational design.

This book takes a user-oriented approach to the design of management accounting procedures and systems. The book also emphasizes the challenges and opportunities from new information technology and the new technology of modern operating and service processes. And, most important, the book features the innovative management accounting developments since the 1980s that leading companies around the world are now using. Students who complete the book should be rewarded with an increased understanding of how management accounting information creates value in organizations. Management accounting has shifted from being the historical scorekeeper to providing information vital for operational and strategic decisions and for motivating and evaluating organizational performance.

ENDNOTES

1. The discussion in this section summarizes material in H. T. Johnson and R. S. Kaplan, *Relevance Lost: The Rise and Fall of Management Accounting* (Boston: Harvard Business School Press, 1987). The development of managerial capitalism in the United States is documented in A. D. Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge: Harvard University Press, 1977). Chandler's work provides an enormously valuable historical perspective on the development of the U.S. corporate organization that has great implications for the modern practice and theory of management accounting.
2. See H. T. Johnson, "Early Cost Accounting for Internal Management Control: Lyman Mills in the 1850s," *Business History Review* (Winter 1972), pp. 466–74; and K. W. Hoskin and R. H. Macve, "The Genesis of Accountability: The West Point Connection," *Accounting, Organizations and Society* (1986), pp. 1–37.
3. Chandler, *Visible Hand*, pp. 267–68.
4. A. H. Church, *The Proper Distribution of Expense Burden* (New York: The Engineering Magazine Co., 1908), pp. 28–29.
5. H. L. Gantt, "The Relation between Production and Costs," presented at the American Society of Mechanical Engineers Spring Meeting (June), reprinted in *Journal of Cost Management* (Spring 1994), pp. 4–11.
6. The developments in these two organizations were not independent of each other. Pierre DuPont rescued General Motors from imminent bankruptcy in 1919, and Donaldson Brown became GM's chief financial officer, serving under the newly promoted president, Alfred Sloan.
7. See Chapters 4 and 5 of Johnson and Kaplan, *Relevance Lost*. One particularly impressive achievement, the GM pricing formula based on ROI control, is described in a problem at the end of Chapter 6 of *Relevance Lost*.
8. For a dramatic illustration of such conflicts, see E. M. Goldratt and J. Cox, *The Goal: A Process of Ongoing Improvement* (Croton-on-Hudson, NY: North River Press, 1986).