COST ACCOUNTING

Accumulation, Analysis and Control

COPELAND AND SULLIVAN

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Preface

COST ACCOUNTING: *Accumulation, Analysis, and Control* is intended primarily for use in college and university courses in cost accounting. This text is also appropriate for an undergraduate or graduate course in managerial accounting designed for those persons who will become users of accounting data. Attention has been given to both "procedures" and "concepts." The *why* as well as the *how* of cost and managerial accounting is presented. It is our belief that a knowledge of both is essential to a true understanding and appreciation of accounting.

Part I explains the accumulation aspect of cost accounting. Topics covered include: objectives of cost accounting, organizations affecting the management accountant, job order costing, and process costing.

Part II covers the basic techniques of management accounting: standard costing, capital budgeting, responsibility accounting, profit planning, direct costing, transfer pricing, cost-profit-volume analysis, and gross profit analysis.

Part III includes an introduction to the quantitative techniques most applicable to management accounting. Knowledge of these techniques is essential for successful completion of both the CPA and CMA professional examinations. Topics included in Part III are regression and correlation analysis, learning curve applications, statistical cost analysis and control, inventory modeling, matrix algebra, and accounting applications of linear programming.

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To the professors who use this text, we request your assistance. We solicit your comments and suggestions as to how this book may be improved. Only with your help can we improve our service to you.

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Historical Cost Accumulation

PART 1

This part emphasizes the accumulation aspect of cost accounting. Topics presented are (1) the objectives of cost accounting; (2) organizations affecting the management accountant; and (3) material, labor, and overhead cost as related to job order and process costing.

OBJECTIVES AND PHILOSOPHY OF COST ACCOUNTING

Chapter 1

OBJECTIVES OF COST ACCOUNTING

Modern cost accounting has a two-fold purpose. Historically, it is a system for marshalling costs of production in order to measure the cost of goods manufactured and sold. This function is frequently referred to as *cost accumulation.*

A second function has evolved over the last fifty years and today its importance surpasses that of cost accumulation. This new function may be referred to as *managerial cost analysis,* i.e., the analysis of costs to aid the decision-making function of organization management.

The dichotomy of purpose of cost accounting is recognized in the organization of this book. Part I is devoted to a description of the generally accepted principles of manufacturing cost accumulation. Parts II and III discuss cost analysis techniques that have been found generally useful in aiding the decision-making function of management.

Managerial cost analysis encompasses a far greater scope than a simple manufacturing concern. The techniques are applicable to widely diversified types of organizations, such as retail establishments, nursing homes, hospitals, restaurants, theaters, and governmental units. While most of the discussion will concern profit-oriented activities, keep in mind that many of these techniques are equally appropriate when accounting for activities that are not profit-oriented.

PHILOSOPHY OF COST ACCUMULATION

Cost accumulation begins when economic cost to the enterprise is recognized in accordance with generally accepted accounting principles. This cost is measured in terms of an historical exchange price. It is recognized in the accounts upon completion of an economic transaction between the accounting entity and an involved, arms-length party.

Immediately upon recognition, this cost represents a bundle of economic utility of future benefit to the accounting entity. Accountants refer to this unexpired economic utility as an *asset.* Some typical assets are raw materials inventory, prepaid insurance, and building and equipment.

As the economic utility of an asset expires, accountants give recognition to its diminution by transferring a proportionate part of its cost to either an expense or a loss account. If the reduction or consumption of economic utility results from profit-oriented activities, then the expired economic utility is transferred to an *expense account.* If the expired economic utility results from other types of events, e.g., a fire, then the expired economic utility is transferred to a *loss account.* Both these accounts appear on the income statement of the period in which the expiration occurs.

The association of expired economic utility with the revenue that its expiration helped to produce is referred to as *matching.* The purpose of matching revenues and expenses is to associate or compare the effort and accomplishment of the firm, where "effort" is represented by expense, and "accomplishment" is represented by the revenue of the firm.[1]

In the manufacturing concern, certain economic utilities undergo a change in nature before they are consumed in the creation of revenue. That is, raw materials are converted into finished products through the application of direct labor and manufacturing overhead. The finished products are then held in the inventory of the manufacturing concern until they are sold.

It is the job of the cost accountant to record this conversion of economic utility. The accounting theory underlying the performance of this function is known as the *costs attach concept*. According to this concept, the accounting value to be placed on the finished product is the sum of the costs of the bundles of economic utility that were converted into the manufactured product.[2]

The accounting cost of the finished goods inventory, therefore, consists of the sum of the costs of direct material, direct labor, and manufacturing overhead that were used in the manufacturing process. In a very real sense, then, the process of accounting for manufactured products is a process of *cost accumulation.*

PHILOSOPHY OF COST ANALYSIS

The philosophies underlying the analysis of cost for the purpose of aiding the decision-making function of organization management are necessarily quite different from those of cost accumulation. For one thing, the users of the data are different. The result of cost accumulation appears on the balance sheet of the manufacturing concern as work in process and finished goods inventories and on the income statement as cost of goods sold. Therefore cost accumulation must be performed in accordance with the generally accepted accounting principles that pertain to third-party reporting.

Managerial cost analysis, however, labors under no such restriction. It is performed by internal accountants, and the results are used mainly by their employers. Therefore it should be performed according to the particular needs of an organization's management.

Parts II and III explore the use of cost analysis for the purpose of aiding managerial decision making.

THE MANAGEMENT ACCOUNTING FUNCTION

The internal management accountant has a dual responsibility. First, he has an obligation to the accounting profession of which he is an essential member. The internal accountant must be the "front line" in the improvement of all aspects of the discipline of accounting—external financial reporting as well as

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1 *An Introduction To Corporate Accounting Standards*, W. A. Paton and A. C. Littleton, Monograph No. 3, American Accounting Association, 1940.

2 *Ibid.*

internal management-oriented analysis. His or her obligations and capabilities in this respect were recently recognized when the management accountant became represented on the Financial Accounting Standards Board, the independent body responsible for the development of generally accepted accounting principles (GAAP).

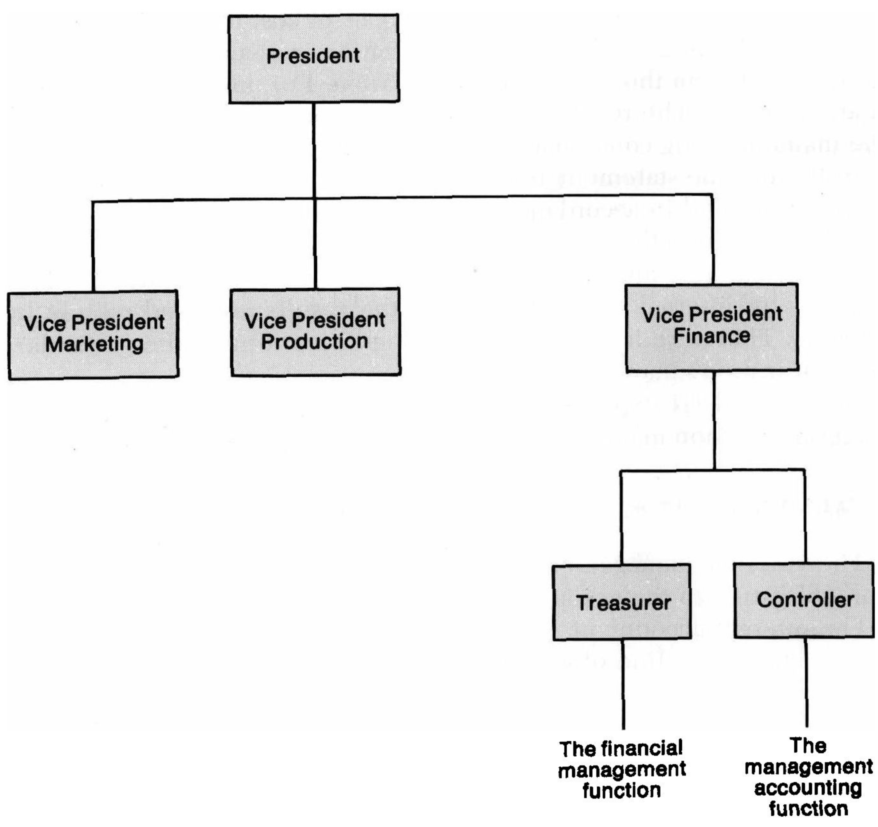
Second, but just as important, the internal accountant has an obligation to the firm of which he is a member. He is responsible for assisting management in the attainment of specified goals and objectives—social as well as financial.

Internal accountants are frequently shown on the organization chart of a firm as illustrated in Figure 1.1.

The functions inherent in management accounting are as follows:

1. Preparation of the annual profit plan to aid management in planning and controlling operations.
2. Assistance to management in long-range planning, especially capital budgeting.
3. Financial accounting and reporting.

Figure 1.1
The Management Accountant in a Typical Organization



4. Cost accumulation for determination of inventories and cost of goods sold.
5. Preparation of special accounting analyses to aid management in decision making.

This book will examine all the above functions with the exception of the financial accounting and reporting function.

THE MANAGEMENT PROCESS

The *management process* is often characterized as consisting of planning, coordinating, and controlling. The management accounting function is essential to the successful performance of each of these objectives.

Planning is the process of preparing for the future. Simply, the steps in planning are as follows:

1. Selecting proper goals or objectives for the firm.
2. Forecasting the future environment of the firm (economic, social, technological, and political).
3. Developing a course of action that will enable the firm to attain its preselected objectives.

This process is frequently referred to as *management by objective*.

The management accountant assists in the planning process by measuring and evaluating the financial aspects of a planned course of action. Accounting is used to estimate the net income that will be produced by the planned course of action and to extrapolate its effects on the firm's financial position. This function is known as *profit planning* or *budgeting*.

Coordinating is the process by which management unites the human and capital resources of the firm toward the attainment of predetermined goals. Accounting provides the main vehicle by which coordination is accomplished—communication. Daily, weekly, and monthly accounting reports communicate the commitment of labor and capital toward the attainment of the firm's goals to the operating management.

Controlling is the final and most important step in the management process. Controlling is performed by comparing the planned results expected with the actual results attained and by taking necessary corrective action when it is appropriate. This is the phase where management reevaluates the effectiveness of past courses of action, the soundness of past assumptions concerning the environment, and the logic of the goals and objectives that were previously established.

Accounting is the primary means of comparison between planned and actual operating results. It is the means by which the principle of *management by exception* is implemented. A significant variance between planned operating results and actual operating results signals management that an investigation (perhaps supported by special accounting analyses) and possible replanning are required. It is in this way that management is able to steer a firm past dangerous financial shoals and bring it safely to a planned financial position on schedule.

Figure 1.2 illustrates the interrelationship between management accounting and the management process.

Figure 1.2
Relationship Between Management Accounting and the Management Process

Management Process	Management Accounting
Planning (management by objectives)	Profit planning (budgeting) Capital budgeting
Coordinating	Periodic accounting reports
Controlling (management by exception)	Comparison of plan to actual results; special accounting analyses

To summarize, the main objective of managerial accounting is to maintain the most responsible utilization of the human and property resources of a firm in order to attain its desired financial position and results of operation.

ORGANIZATIONS AFFECTING THE MANAGEMENT ACCOUNTANT

The management accountant must be aware of the organizations that have a significant effect on his profession. These organizations include:

1. The Securities and Exchange Commission (SEC).
2. The American Institute of Certified Public Accountants (AICPA).
3. The Financial Accounting Foundation (FAF).
4. The Financial Accounting Standards Board (FASB).
5. The Financial Executives Institute (FEI).
6. The American Accounting Association (AAA).
7. The Cost Accounting Standards Board (CASB).
8. The National Association of Accountants (NAA).
9. The Institute of Management Accounting (IMA).

SEC

The Securities and Exchange Commission was created by the Securities Act of 1933, following the difficulties of the great depression. Essentially, the Securities Act of 1933 provided for "full disclosure" regarding the sale of securities to the public. The Securities and Exchange Commission was created to enforce the provisions of this act.

The authority of the SEC is very broad. Among other things, it has the legal right to prescribe the form and methods to be followed in the preparation of all published financial statements for publicly held companies. These required procedures are spelled out in Regulation S-X and in the *Accounting Series Releases* promulgated by the commission. The Securities and Exchange Commission bears primary responsibility within the public sector for the determination of and compliance with generally accepted accounting principles.

AICPA

The American Institute of Certified Public Accountants is the national organization of certified public accountants. Among its many significant activities, which span the entire profession of accounting, are the following:

1. Development and grading of the uniform CPA examination.
2. Research into the development of financial accounting principles, and the presentation of this research to the FASB.
3. Research into the attest function of the public accountant, and the promulgation of auditing standards based on this research.
4. Publication of *The Journal of Accountancy*, perhaps the leading accounting periodical.
5. Research into the nature of management advisory services, including publication of *Management Services Technical Studies.*
6. Research into federal income taxes, and presentations on income taxes before the Congress of the United States.

Because of the AICPA's preeminence in the history of the development of accounting theory, earned as a result of its invaluable publications—51 *Accounting Research Bulletins* and 31 *Accounting Principles Board Opinions*—it has been granted the right to appoint the trustees of the Financial Accounting Foundation. The foundation is a separately chartered corporation whose principal duty is to appoint and fund the Financial Accounting Standards Board. The president of the AICPA is a trustee of the foundation by virtue of his office. The other eight trustees are appointed by the board of directors of the AICPA. Four of the eight must be CPAs from public practice. The four remaining trustees are chosen from lists of nominees submitted by the Financial Executives Institute, the National Association of Accountants, the Financial Analysts Federation, and the American Accounting Association.

FASB

The Financial Accounting Standards Board was created in 1972. Its primary function is to establish standards for financial accounting for purposes of public reporting. The board consists of seven full-time members that are appointed by the trustees of the Financial Accounting Foundation, the parent body.

Four of the seven members must be CPAs who are experienced public accountants. The other three members, who need not (but may) possess the CPA certificate, are selected according to their experience and knowledge of the problems of financial reporting.

The board has responsibility for issuing *Statements of Financial Accounting Standards, Interpretations of these Statements,* and *Interpretations of the Accounting Principles Board Opinions* previously issued by the AICPA. In summary, this body bears primary responsibility for the determination of generally accepted accounting principles within the private sector of the economy.

FEI

The Financial Executives Institute is an organization made up of individuals who have significant responsibility for the financial management of large business enterprises.

An especially important activity of the FEI is the publication of the *Financial Executive*, previously known as *The Controller*. This periodical has become required reading for persons involved in either the financial management or the controllership function of large business enterprises.

The business and accounting communities have recognized the Financial Executives Institute as one of the leading spokesmen for the private financial sector in the United States. Recognition of this standing is evidenced by the fact that it is one of only four organizations that is entitled to nominate trustees for the Financial Accounting Foundation.

AAA

The American Accounting Association is a national organization made up primarily of college and university professors of accounting. Its main activities consist of sponsoring research into the nature of accounting and publishing the *Accounting Review*. The *Accounting Review* has come to be recognized internationally as a leading journal for the publication of fundamental research concerning the discipline of accounting.

This fundamental approach, coupled with the especially high quality of the reseach, has resulted in publications that have had a profound impact upon the accounting profession. The American Accounting Association is also one of the organizations privileged to nominate trustees for the Financial Accounting Foundation.

CASB

The Cost Accounting Standards Board was created in August, 1970, by the Congress of the United States as an agent of Congress. It is chaired by the Comptroller General of the United States. The board consists of four members who are appointed by the chairman.

The primary charge given to the CASB was that of promulgating cost accounting standards to be followed by prime contractors and subcontractors in the negotiation, administration, and settlement of negotiated defense contracts. However, because of the successful manner in which the CASB has accomplished this primary charge, the promulgations of the CASB have been extended to apply to contracts of nondefense agencies through the Federal Procurement Regulations.

In evaluating the effectiveness of the CASB to date, the following conclusions seem warranted:

1. The standards issued to date have resulted in a greater consistency and

improved accuracy in the cost estimates contained in government contract proposals.
2. The increased disclosure requirements established by the CASB have improved the negotiating position of the federal government. Also, these disclosure requirements have significantly eased the task of contract administration for the government.
3. Finally, the CASB standards have helped the Defense Contract Audit Agency in its job of auditing government contracts.[3]

NAA

The National Association of Accountants is a national organization of persons interested in accounting. The NAA, with a membership in the tens of thousands, has some 300 local chapters throughout the United States and foreign territories that hold monthly technical meetings. Its monthly publication, *Management Accounting,* is a major publication for the management accountant.

The NAA recently established the Committee on Management Accounting Practices to promulgate *Statements on Management Accounting Practices.*

Through the issuance of these "MAPs," the NAA has a formal voice in the development of management accounting. Also, the NAA exerts influence on the development of generally accepted accounting principles by testifying before the FASB at public hearings and by virtue of its right to nominate trustees for the Financial Accounting Foundation.

Equally important is the NAA's creation of the Institute of Management Accounting and the Certificate in Management Accounting program.

IMA

The Institute of Management Accounting is an independent body that was established by the National Association of Accountants in 1972. It has been charged with the responsibility for implementing and administering the Certificate in Management Accounting (CMA) program. This responsibility includes:

1. Evaluating the credentials of candidates who wish to sit for the CMA examination.
2. Writing, administering, and grading the examination.
3. Granting certificates.
4. Supervising the continuing education requirement for holders of the certificate.

The CMA is granted to those individuals who:

1. Meet the basic qualifications for membership in the IMA [i.e., individuals who have a baccalaureate degree, a satisfactory score on the GRE or the GMAT (ATGSB) examinations, or are CPAs].

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3 See *Progress Report to the Congress, 1974,* Cost Accounting Standards Board, August 15, 1974.