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A Systems Approach to Accounting and Internal Control

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"A SYSTEMS APPROACH TO ACCOUNTING AND INTERNAL CONTROL"

An independent study submitted to the faculty of the University of North Dakota in partial fulfillment of the requirements for the degree of master of science.

by

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INTRODUCTION

Accounting in the functional business situation today can be classified as a systems approach, because of the complexity of most business entities. Systems are present today as an accounting methodology. The purpose of this paper is to gain a better understanding of systems approach to accounting and internal control as it applies to the functional business situation. To accomplish this, systems will be reviewed, systems relationship to accounting and internal control will be examined and several graphic techniques for systems presentation will be analyzed.

The procedure that will be followed in this study is best depicted in a chapter outline. To set the stage for the balance of this paper, Chapter One will make a review of the relationship of systems to accounting. Therein, systems will be defined, comment will be made on the major characteristics of systems, and how accounting related to each of these major characteristics will be depicted.

The second chapter will act as a basis for the following chapters and is a brief description of a small business to be used for developing an accounting system.

In the third chapter, a flow charting technique using "T" account designation will be described. Also, an accounting system for the business described in Chapter Two will be developed using this technique.

CHAPTER

SYSTEMS AND ACCOUNTING

The Relationship

"The essence of system is interrelationship among elements."[1] Accounting was the original business system--simply a set of procedures for preparing and handling information according to a predetermined program established to help carry out the objectives of the business.[2] This is to view accounting in a sterile and rather base sense which is far from the realities of present involvement in any business entity.

Accounting today is one of the four or five major functions in a business and is found and felt at different levels of administration, from highest to lowest. Accounting involvement in business enterprise is a direct result of the increase in size of businesses. The management decision-making processes of planning, coordination, control, and protection has become more complex and demanding. To accommodate this, the accounting system has gathered, sifted

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[1]Peter A. Firmin and James J. Linn, "Information Systems And Managerial Accounting," The Accounting Review, Jan., 1968, p.75.

[2]John P. McNerney, "Accounting And Its Relation to The Systems Concept," The Ohio CPA, May, 1963, p.54.

studied, and made available in meaningful contexts, much of the data, the standard for decision-making, wanted by management.[3]

At first, crude systems were developed for those activities which involved the greatest volume of repetitive activity--payroll, accounts receivable, accounts payable, etc. These partial and rudimentary sub-systems employed equipment in many cases. What was more important, they required integration of activities and recognition of a cycle, from beginning to end, which used common forms, procedures, methods, equipment and appropriately trained people. The next step in an operational system was to cut across established organizational lines to provide for a total system.

Payroll is a good example. To get a good payroll system in operation, it is necessary to integrate and standardize the activities of all people who have anything to do with it. The worker must perform his part by handling his clock card in a prescribed manner at a prescribed time if just the first step of the system is to be made operative. The time clerk must perform his standardized operation at the appropriate time. The same is true for the foreman, the payroll clerk and the treasurer. In order for the system to work, each participant must

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[3]J. Brooks Heckert and Harry D. Kerrigan, "Role of Accounting in Management," Accounting Systems: Design And Installation (The Ronald Press Co., copyright 1967), p.9.

perform his standard task at the proper time in the proper sequence according to instructions established in advance in a detailed procedures manual. The activities of the several participants are prescribed by this system; as individuals they have no alternative but to perform those activities. The essential point here is that the system establishes rules governing the work of people in different functional jurisdictions of the organization. The system is the set of operating rules that binds all activities together. A functional organization chart may show that the foreman exercises jurisdiction over the worker, but as regards timekeeping and piece-count, he does not. The payroll system controls that. The chart may show that the production superintendent is responsible for the work of the foreman, but as regards payroll practices, he is not. Again the payroll system controls that. The chart may show that the controller is responsible for the work of the payroll clerk, but as regards payroll practices, he is not. Once more, the payroll system controls. The controller may have been instrumental in establishing the system, in concert with others, but his main function as regards payroll is simply to see that an appropriate, essentially self-operating system is designed and installed.[4]

As the preceding paragraphs would indicate, systems

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[4]John A. Beckett, "Management Accounting in The Age of Systems," NAA Bulletin, April, 1964, pp.5-6.

for the most part, are the method by which businesses today function, and accounting needs, control and information are for a large part the bases for the systems.

There are several significant characteristics of any system that makes them practically synonymous with accounting. First, systems are cyclical in nature. That is, they really have no start and no end; they are circles, and they are interrelated within a business.[5] Second, systems are for the purpose of collecting, assembling, evaluating, and making available information to facilitate decision-making and planning.[6] Third, systems provide for an effective control within the business for operational efficiency and safeguarding assets. The balance of this chapter is devoted to an expansion of the preceding characteristics of systems and specifically as they relate to accounting as a business function.

First, systems are cyclical in nature. Systems apply to business operations and the circulation process within a business that starts at its inception. The individual business entity is part of a much larger circulation process--the core of economic activity, which is the circulation of values. Within the individual entity, goods and money flow in opposite directions. This process is illustrated by Graph Number 1. Goods and services enter the entity from

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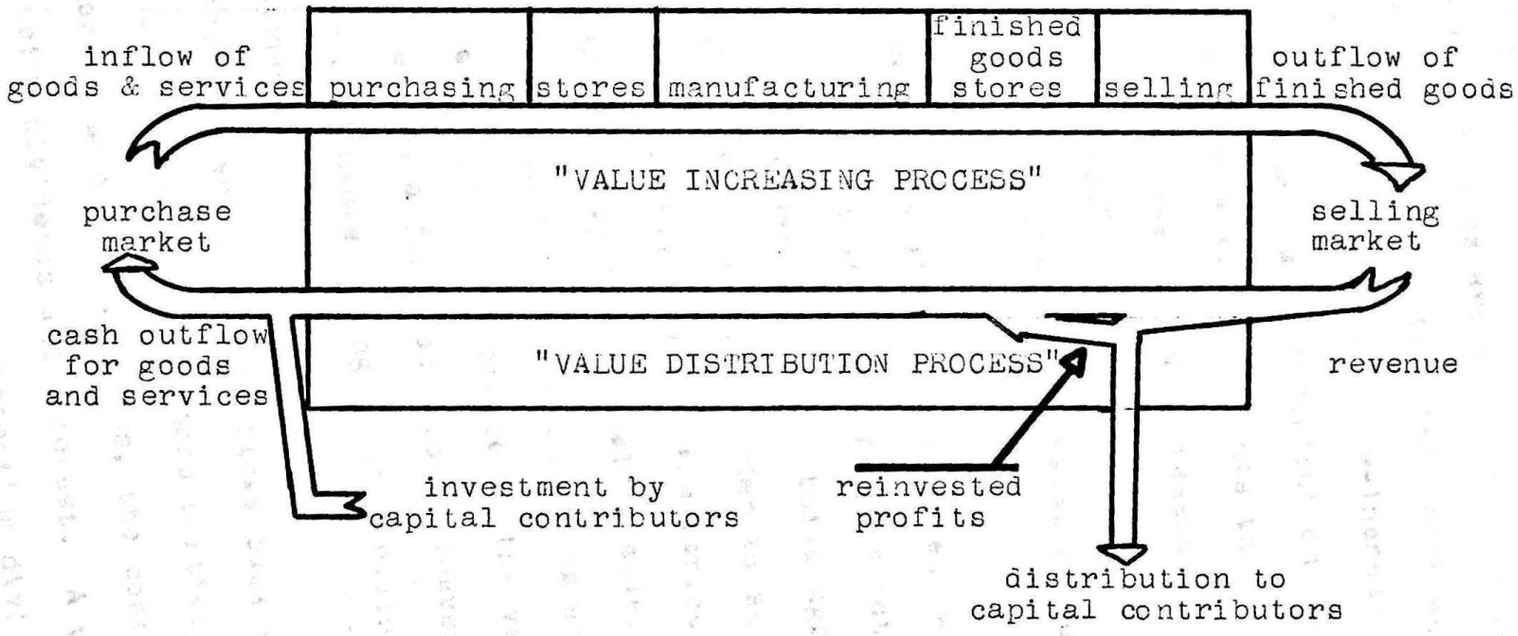
[5]Ibid., p.6.

[6]McNerney, "Accounting And The Systems Concept," p.54.

GRAPH NUMBER 1[7]



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[7]Hanns-Martin Schonfeld and H. Peter Holzer, "A 'Business' Flow Chart And Its Use as a Teaching Aid," The Accounting Review, Jan., 1962, pp.118-120.

the purchase market, their value increases (or should increase) as they go step by step through the operating cycle of the business. When the goods are sold, money flows back into the entity and must now be distributed among all the factors that have participated in the value-increasing process. This is called the "value distribution process." On the flow chart the upper arrow represents the "value-increasing process." The lower arrow represents the "value distribution process." These two arrows should illustrate the circulation process that takes place within a business.

As has been stated, the circulation process within a business starts at its inception. Money flows into the enterprise and is used to purchase land, buildings, equipment, materials, labor, etc., in order to start operations. As the goods move through the various segments of the business entity toward their completion, costs are incurred. Each additional cost item should be compensated by a corresponding increase in the value of the goods. By the time a finished product leaves the plant, all value components making up its selling price should have accrued.

As the goods are sold, revenue flows back into the entity and is distributed among factors participating in the "value-increasing process." Thus, the contributors of capital receive dividends and interest. A vertical arrow indicates that amounts representing dividends and

interest leave the entity's circulation process. Another vertical arrow represents the inflow of the original capital and possible subsequent financing by owners and creditors.[8]

Systems are and have been designed and implemented for separate functions of the business entity such as the payroll system briefly described earlier. But it is apparent that the objective of systems work is a total system, an all-embracing formalized system for the operation of business as a whole. The system being interrelated within a business must follow the same cyclical nature.

Accounting embraces the cyclical nature of the business entity on much the same basis as does systems. By expanding the basic accounting formula (assets = liabilities + equity) slightly and incorporating the relationship among revenue, expense and net income (net income = revenue - expenses),[9] a closed-loop or continuous uninterrupted cyclical flow is presented as in Graph Number 2,[10] indicating even on a basic level the circular nature of accounting represented in the operating cycle.

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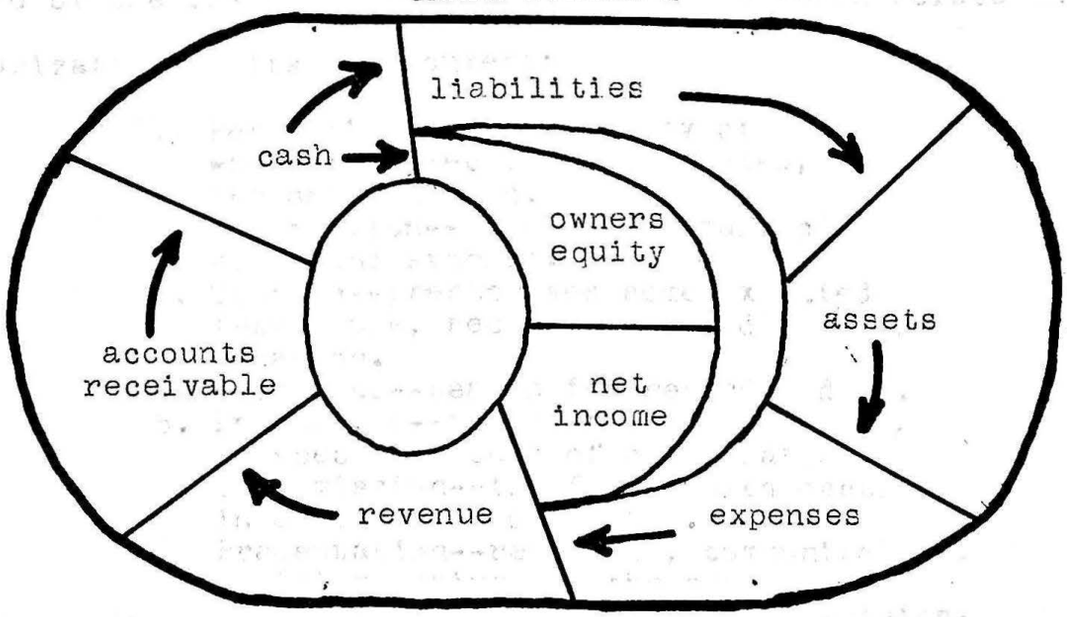
[8]Hanns-Martin Schonfeld and H. Peter Holzer, "A 'Business' Flow Chart And Its Use as a Teaching Aid," The Accounting Review, Jan., 1962, pp.118-120.

[9]American Institute of Certified Public Accountants, APB Accounting Principles, Original Pronouncements (Commerce Clearing House, Inc.), Dec.1, 1971, pp.9082-83.

[10]Albert J. Schneider, "Flow-Graph Notation in Accounting," The Accounting Review, April, 1967, p.348.

GRAPH NUMBER 2[11]



Second, systems are for the purpose of collecting, assembling, evaluating, and making available information to facilitate decision-making and planning. Information is purpose-oriented organized data and is a requisite for survival of all organizations. All purposive organizations must be "managed"--directed toward a goal. The system enables the process of management by providing information. The term "total information system", when applied to the management information system, connotes all of the information needed by management and implies a "systems approach" to the study of management's information requirements and their satisfaction.

A management information system is a system for accepting data as raw material, and through one or more transmutation processes, generating information as a product. It is com-

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[11] Schneider, "Flow-Graph Notation,", p.348.

posed of the following functional elements which relate the organization to its environment:

> "1. Perception--initial entry of data, whether collected or generated, into the organization.
> 2. Recordation--physical capture of signs and symbols.
> 3. Storage--presupposes some expected future use, recordation, and a location.
> 4. Retrieval--search for recorded data.
> 5. Processing--transformation according to specific needs of organization.
> 6. Transmission--the flows which occur in an information system.
> 7. Presentation--reporting, communication.
> 8. Decision-making--to the extent, the information system engages in decision-making that pertains to itself."[12]

Accounting is defined, in APB statement number 4 of the APB Accounting Principles, as a "service activity. Its function is to provide quantitative information, primarily financial in nature, about economic entities that is intended to be useful in making economic decisions--in making reasoned choices among alternating courses of action."[13] The product of any accounting system, like that of all other information systems, is information.[14] The nature of accounting is that of an information system, as the American Accounting Association's 1965-66 Committee on Basic Accounting Theory has pointed out.[15]

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[12]Firmin and Linn, "Information Systems," pp.75-76.

[13]American Institute of Certified Public Accountants, "APB Accounting Principles," p.9067.

[14]Norton M. Bedford, "The Nature of Future Accounting Theory," The Accounting Review, Jan., 1967, p.82.

Third, systems provide for effective control within the business for operational efficiency and safeguarding assets. Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives. Ordinarily, the system that is used in the control process is a total system in the sense that it embraces all aspects of the company's operations. It needs to be a total system because an important management function is to assure that all parts of the operation are in balance with one another; and in order to examine balance, management needs information about each part.[16]

In the Statement on Auditing Procedure Number 54, November 1972, the importance of control to accountants is stressed and accounting control is defined:

"Accounting control comprises the plan of organization and the procedures and records that are concerned with the safeguarding of assets and the reliability of financial records and consequently are designed to provide reasonable assurance that:

a. Transactions are executed with management's general or specific authorization.
b. Transactions are recorded as necessary, (1) to permit preparation of financial statements in conformity with generally accepted accounting principles or any other criteria applicable to such statements and (2) to maintain accountability for assets.

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[16]Robert N. Anthony, Planning And Control Systems: A Framework For Analysis, (Division of Research Graduate School of Business Administration, copyright 1965), p.35.

c. Access to assets is permitted only in accordance with management's authorization.
d. The recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences."

Also, stressed in SAP 54 is that administrative and accounting controls are not mutually exclusive because some of the procedures and records comprehended in accounting control are also involved in administrative control.[17]

Two of the most striking implications of systems are their impact on the nature of business organization and upon the activities of management. Systems when implemented and integrated into the business entity, cut across organizational lines and because of the nature of system, take some of the traditional prerogatives of decision-making and planning functions away from individuals.[18]

Systems breed coordination, and with it a de-emphasis of the planning function and of the decision-making power and personal responsibilities of all but the top planners and decision-makers. As a result, whatever use traditional organization charts have had as a means of describing human interrelationships and individual responsibilities in business organizations, they have for the most part, lost

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[17]Committee on Auditing Procedure American Institute of Certified Public Accountants, "The Auditor's Study And Evaluation of Internal Control," Statement on Auditing Procedures Number 54, (The American Institute of Certified Public Accountants, copyright 1972), p.239-40.

[18]Beckett, "Management Accounting," p.4.

their value as a visual expression of those interrelationships and responsibilities in a systems-oriented business. Jobs down the line are no longer centers of significant cost or profit responsibility. They are not centers at all, but more like functions of subsystems, no one of which is either more or less important than all others. Business organizations, under advanced systems become more centralized. This means that responsibility, and any other than merely servo-mechanistic decision-making, is concentrated at and near the top.[19]

Again, accounting was the original business system and frequently in many businesses is still the only formalized system. But accounting is only one of the many control systems. In its function of communicating information to aid in the development of judgments and the making of decisions, it has always been supplemented by means outside the accounting system. This was inevitable as business has grown up. They range from detailed production reporting and scheduling systems through systems for planning manpower needs and evaluating personnel development, to over-all systems for reporting management information.[20] The total systems concept, an all-embracing formalized system for the operation of business as a whole, is the obvious object of systems work.[21]

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[19]Beckett, "Management Accounting," p.8.

[20]McNerney, "Accounting And The Systems Concept," p.54.

[21]Beckett, "Management Accounting," p.7.

CHAPTER 2

A HYPOTHETICAL BUSINESS

The essence of this chapter is to form a basis for the following chapters. In any problem-solving situation, the first step is to identify and isolate the problem. However, in this case, a problem must first be created. That is, create a small business with which to work. Since the purpose of the balance of this paper is to create an accounting system for, and integrate it into, a small business, a subject around which to build the system is necessary. In reality the situation is not one of actually developing a small business, but to create limiting factors so the situation is workable. To be workable, the basic operations of the business must be rather limited so each may be dealt with in adequate depth.

Two of the most basic requirements of the business to be portrayed are that is a wholesale operation, and that it has an assembly operation. There are several reasons for designating this type of firm as opposed to others. First, a wholesale activity will be used because of the nature of transactions in which it is involved. Purchase and sales would be limited to a small number of individuals. Although even in this case separate sales, purchases, cash receipts and payment journals might be desirable, the nature of the study does not justify it.

Also, a cash register type sales will not be included when integrating the system into the business, as this would be unduly burdensome in the type of analysis to be conducted. The reasoning behind this should become obvious in the final chapter.

Second, a wholesale type operation will allow for merchandise sales rather than a charge for services as in a service-oriented operation.

An assembly operation will be included in the business because it allows for some cost accounting. Although inclusion of cost accounting will make the system established more expansive, it will show the value of the visual presentation.

The assembly operation will have a job order cost system that will utilize actual costing as opposed to standard costing. The company's assembly operation will be for one product conducted in one department for the sake of simplicity.

In identifying the business, a chart of accounts will be established and an organization chart developed. The chart of accounts will be used in Chapter Three as a basis for the accounting system. The organization chart will be used in Chapter Five to integrate the accounting system into the business organization structure. However, both of the charts--for accounts and organization--will serve in this chapter, to delineate the company, as opposed to an extended

narrative. An example of this approach is in the chart of accounts, balance sheet section. Owners equity is used to indicate a sole proprietorship as opposed to a corporate structure.

The Chart of Accounts

A chart of accounts is a basic scheme or system for organizing accounting data to facilitate its control and classification to the end that it can be used most effectively in the management of business.[22] In anticipation of that end, it governs the channeling of data all through the prior stages of processing, including the intermediate summarization that details of procedures of a given company system may prescribe.[23]

The chart of accounts (Chart 1), is for the normal transactions of the company that has been described. There are accounts for classification of transactions that are normal for this type of business that have been eliminated. This is a limiting factor considering the scope of this study. Examples of this are allowance for doubtful accounts, sales returns and allowances, purchase returns and allowances, etc.

The Organization Chart

An organization is a system of communication, a means of problem-solving and a means of facilitating decision-

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[22]Oscal S. Nelson and Richard S. Woods, Accounting Systems And Data Processing (Southwestern Publishing Co., copyright 1961), pp.45-46.

[23]Heckert and Kerrigan, "Accounting in Management," pp.69-70.

CHART NUMBER 1

The Chart of Accounts[24-25]

Balance Sheet Accounts

ASSETS

Cash
Accounts Receivable
Inventories:
  raw materials
  goods in process
  finished goods
  factory supplies
Unexpired Insurance
Factory (Bldg. & Equip.)
Accumulated Depreciation
  Factory
Office (Bldg. & Equip.)
Accumulated Depreciation
  Office

LIABILITIES

Accounts Payable
Accrued Payroll

EQUITY

Owners Equity

Income and Expense Accounts

Sales
Cost of Goods Sold
Operating Expenses:
  salaries
  selling expenses
  office expenses
  depreciation expense office

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[24]Frederick M. Eisner, "Whclesalers (Dry Goods)," Encyclopedia of Accounting Systems, 1st Ed., V, pp.1819-22.

[25]H.A. Finney and Herbert E. Miller, Principles of Accounting Intermediate (Prentice-Hall, Inc., copyright 1965), pp.28-31.

making. An organization is all these things. But for practical purposes, organizing can be defined simply as a process of (1) determining what must be done if a given aim is to be achieved; (2) dividing the necessary activities into segments small enough to be performed by one person; and (3) providing a means of coordination.[26]

The simplest way of describing an organization structure is through an organization chart. Specifically, an organization chart shows (1) the principal jobs and the principal channels of communication; (2) the building blocks of the organization; and (3) the levels.[27]

The organization chart (Chart 2) serves a descriptive function. Although the chart is very basic, it will, by showing the necessary functions, serve the purposes of this paper without being unduly involved.

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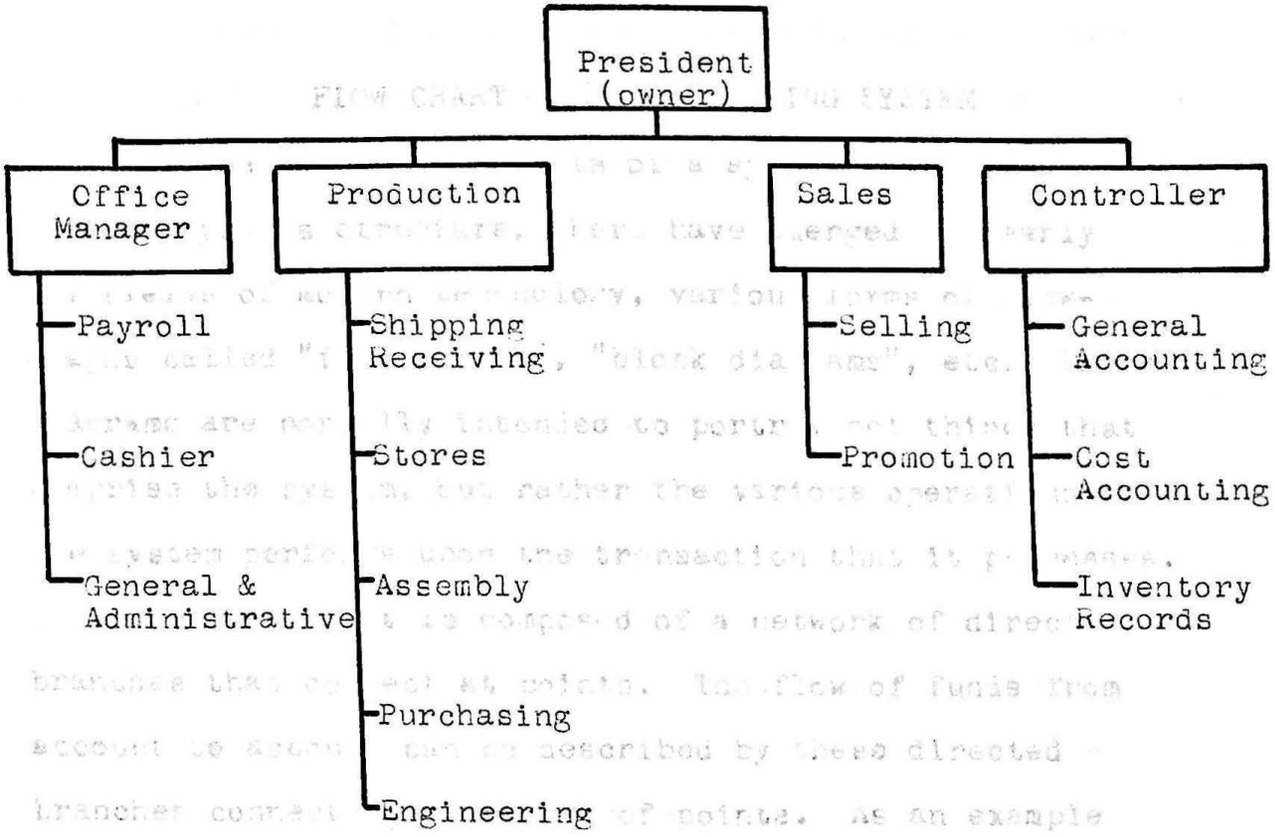
[26]Ernest Dale, Organization, (American Management Association, copyright 1967) p.9.

[27]Ibid, p.233.

CHART NUMBER 2

The Crganization Chart[28]



[28]Eisner, "Wholesalers," p.1818.

CHAPTER 3

FLOW CHART OF AN ACCOUNTING SYSTEM

To meet the requirements of a symbolism to visually present systems structure, there have emerged in nearly all fields of modern technology, various forms of flow-graphs called "flow charts", "block diagrams", etc. These diagrams are normally intended to portray not things that comprise the system, but rather the various operations that the system performs upon the transaction that it processes.

The flow-chart is composed of a network of directed branches that connect at points. The flow of funds from account to account can be described by these directed branches connecting a network of points. As an example of this type of notation, the basic accounting terms can be defined and then expressed in flow chart notation:

"(The definitions as used here are highly simplified and are not intended to illustrate the notation method.)

> Assets (A) are service potential, the cost of goods and services available for future use to produce revenue. Expenses (E) are expired costs; assets that have made their contribution to the production of revenue in the current income determination period. Revenue (R) is a measure of the service performed for the customer by a business enterprise. Revenue results in an inflow of assets, and since there is an exchange of equal values, the accountant measures the service performed as equal to the assets received in exchange therefore."

"The dynamics of these relationships can be expressed in the flow-chart notation:

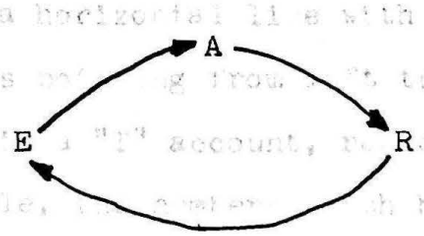
$$A \longrightarrow E \longrightarrow R \quad (1)$$ "

This formula, like a chemical formula, expresses the transformation of system components to emphasize the changing form of the stuff that makes a system. Too often in accounting books, revenue is defined as the assets received for services performed. However, the realization principle emphasizes that an asset conversion takes place in the exchange transaction where two things of equal (but not the same) value are exchanged. Thus, the accountant can measure the value of the services performed as equal to the value of the assets received.

Flow-chart notation can be used to emphasize that the performance of services results in an asset in-flow:

$$R \longrightarrow A \quad (2)$$

If these two formulas--(1) and (2)--are combined, the following relationship (3) is obtained which implies the closed-loop aspect of the operating cycle and the ready application of flow-charting to the accounting system:[29]



(3)

[29] Schneider, "Flow-Graph Notation," p.344-345.

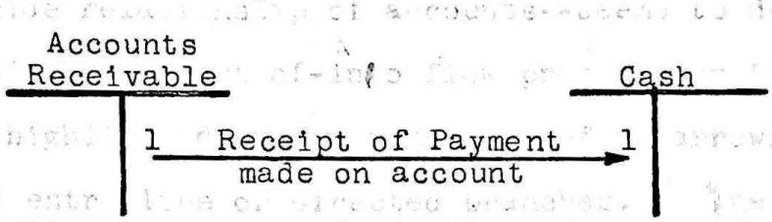
An accounting flow chart is simply the graphic presentation of related journal entries usually setting forth the accounting flow and relationships reflected by such entries. This kind of presentation facilitates comprehension of the overall effect of a series of steps.[30]

In accounting flow charts, the "T" account can be used to indicate the journal entries or points. The directed branches then describe the flow relationships between the accounts, as the processing of a transaction that has occurred.[31]

An example using a journal entry in conventional form is useful to illustrate the application. First, a journal entry to indicate the receipt of $XXXX cash on account:

Debit	Cash	XXXX	
Credit	Accounts Receivable		XXXX

Next, by use of "T" account and directed branches, the transaction is displayed in flow-chart form:



In this simple example is the principle of the accounting flow-chart, in which a horizontal line with an arrowhead or directed branch always pointing from left to right, always beginning and ending in a "T" account, represents a journal entry. In this example, the numbers which have been placed

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[30]William J. Pladies, "The Accounting Flow Chart," The Journal of Accounting, July, 1965, p.45.

[31]Schneider, "Flow-Chart Notation," p.345.

on the horizontal line are used to identify the transaction which has taken place.[32]

With this brief description of the account flow-chart technique, the next step is to apply it, on an expanded basis, to the business as described in the preceding chapter. By using the established chart of accounts, the accounting system may be presented visually (Chart 3).

From the visual representation of the accounting system, two characteristics of the system deserve comment. The flow-chart indicates relationship of the accounts and movement through the system and the nature of transactions that occur and where they occur.

Perhaps one of the more revealing observations obtained by constructing a visual accounting system, is the relationship of the accounts within the system. The total movement through the system--the out of the credit side and into the debit side relationship of accounts--seems to develop naturally. This out of-into flow presents an illusion of motion highlighted by the placement of an arrowhead on the journal entry line or directed branches.[33] The overall effect is to present a macro-view of the accounting activities, of a business entity, as a system of related activities with motion of a cyclical nature.

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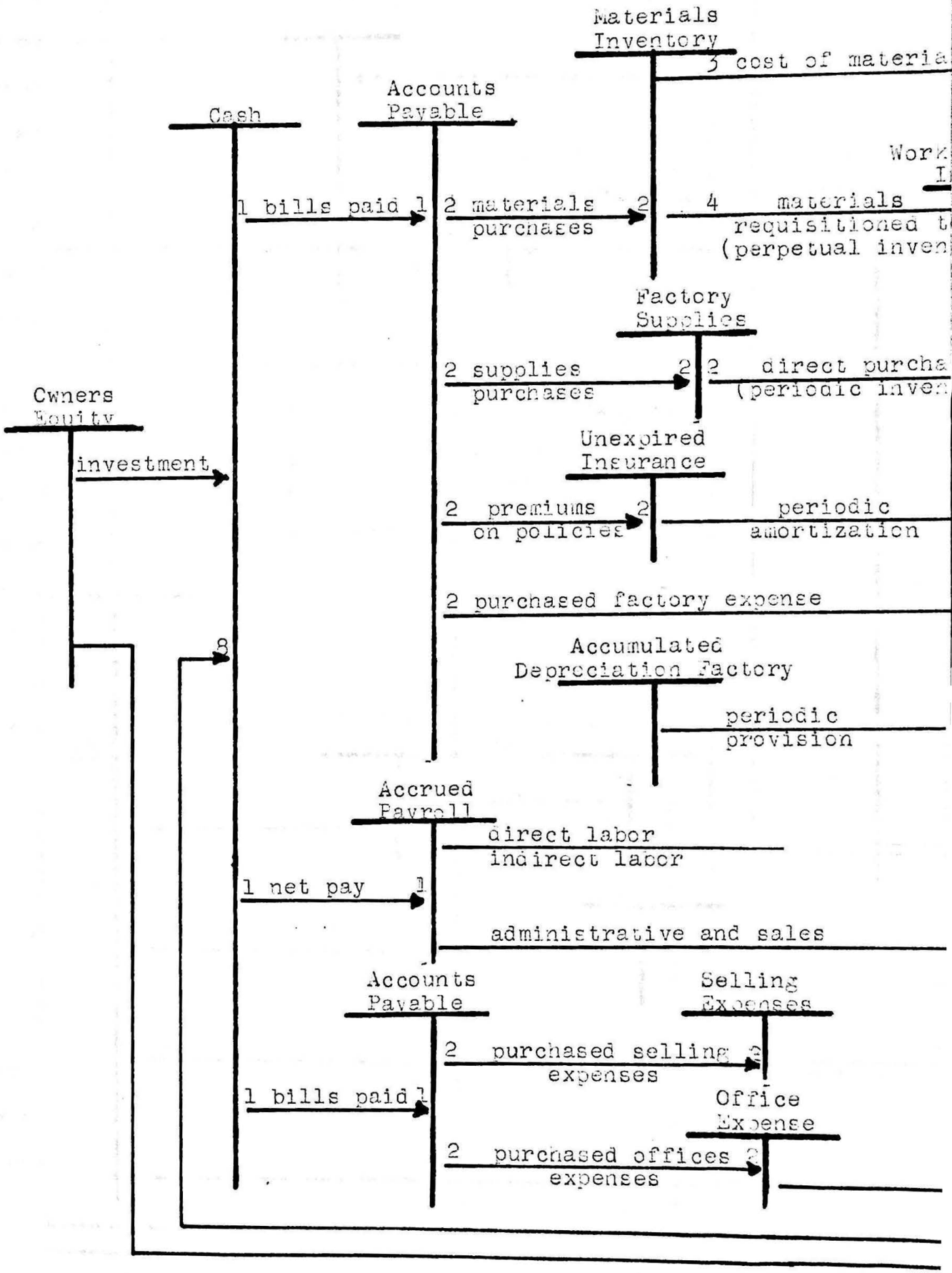
[32]Pladies, "The Accounting Flow-Chart," p.45-47.

[33]William H. Huggins, "Flow-Graph Representation of Systems," Operations Research And Systems Engineering, (Johns Hopkins Press, copyright 1960) p.49.

CHART NUMBER 3

Accounting System "T" Flow



Generally, transactions within a business can be grouped because of their similar and repetitive nature. By placing numbers on the directed branches, the transaction of events that occur within the system can be identified as groups. This is significant because the purpose of the system is the processing of transactions or events for control and information in carrying out the objectives of the business. To this end, the system as presently developed, can be utilized for identifying the areas in which procedures are needed. This point is important as the crux of Chapter Five deals with these procedures as a means of integrating the accounting system into the business.

The following is a list of the transactions identified in the accounting system developed in Chart 3. The identifying numbers are significant here as the nomenclature used in this listing has in some cases, been changed for the purposes of homogeneity and descriptiveness. Also note all transactions that are on the chart are not listed, as not all will be used:

1) cash disbursements,
2) requisition and purchase,
3) sale of inventory,
4) requisition of materials to work-in-process,
5) transfer of goods from work-in-process to finished goods,
6) payroll distribution,
7) sales on account,
8) cash sales

A point that should be stressed at this time, is that the accounting system in this chapter was developed for the purpose of demonstrating the flow-chart principle

and as a basis for further analysis in Chapter Five. It is not the purpose in anyway, to indicate it as completely adequate or to recommend its usage.

CHAPTER 4

RESPONSIBILITY ACCOUNTING AND INTERNAL CONTROL

This chapter is devoted to two accounting concepts that are currently receiving much attention in accounting literature as important parts of functional accounting system. These much-related concepts are internal control and responsibility accounting. Internal control and responsibility accounting are significant at this point in this paper because of their relationship to the accounting system and the role they play in the development of the accounting system and its integration into the business entity.

The accounting system is made up of the processing of the flow of transactions, as would be indicated by the previous chapter. As set forth in Statement on Audition Procedures Number 54, "The Auditor's Study And Evaluation of Internal Control," transactions are defined to include exchanges of assets or services with parties outside the business entity, and transfers or use of assets or services within it: "The primary functions involved in the flow of transactions and related assets include the authorization, execution, and recording of transactions and the accountability for resulting assets. Transactions are the basic component of business operations, and therefore are the primary subject matter of internal control." This statement would indicate a direct relationship between internal

control and the accounting system.

Internal control is defined by the American Institute of Certified Public Accountants as follows: "Internal control comprises the plan of organization and all of the coordinate methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its accounting data, promote operational efficiency and encourage adherence to prescribed managerial policies."[34]

In their Statement on Auditing Procedures, Number 54, the American Institute of Certified Public Accountants state that internal control includes controls which may be characterized as either administrative or accounting. They define administrative control as in the following paragraph and accounting control as indicated on page 12 of Chapter One: "Administrative control includes, but is not limited to, the plan of organization and the procedures and records that are concerned with the decision processes leading to management's authorization of transactions. Such authorization is a management function directly associated with the responsibility for achieving the objectives of the organization and is the starting point for establishing accounting control of transactions."

They then go on to say the following: "The foregoing definitions are not mutually exclusive because some of the procedures and records comprehended in accounting control

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[34]Committee on Auditing Procedure, Auditing Standards And Procedures (New York: American Institute of Certified Public Accountants, 1963) p.27.

may also be involved in administrative control. For example, sales and cost records classified by products may be used for accounting control purposes and also in making management decisions concerning unit prices or other aspects of operations."[35]

At the end of Chapter One, reference was made to the total systems concept as the goal of systems work and at that time definition was made of total systems as an all-embracing formalized system for the operation of business as a whole. If total systems are in fact the goal of systems work and accounting systems are an integral part of or a subsystem in the total system, the statement that the definitions of administrative control and accounting control are not mutually exclusive is not completely accurate. Herein it is more accurate to say in relation to systems, that rather than merely "not mutually exclusive" administrative and accounting controls are highly related, if not difficult to separate. This will become more clear in later comments on responsibility accounting in this chapter.

One of the major problems in setting up an accounting system is how to achieve internal control. Control means control of people. Control involves measuring the performance of people as they discharge their responsibilities. It involves reviewing the performance of employees to see that

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[35] Committee on Auditing Procedure American Institute of Certified Public Accountants, "Internal Control," pp.239-40.

what they do is carried out in accordance with the plans and policies of management. In other words, control means pointing out mistakes of judgment and performance so that remedial action can be taken. Control is necessary because responsibilities are delegated within an organization. By successive delegations of functions and tasks, an organization to operate a business is created, with specific responsibilities being assigned to each person involved. Each person in the chain of delegated responsibility must exercise control over those who are then responsible to him. Control can be exercised through personal observation by superiors, through reports, through consultation, through automatic checks by other persons carrying out their assigned tasks, and by internal and external auditing.

Controls of various sorts are built into the organization and made effective through precise definition of duties, responsibilities and authorities. The control that comes from within the organization as a result of dovetailing of responsibilities with reviews of results flowing to those in higher positions of authority is what is often meant by the term internal control. In this broad sense, internal control refers to the overall efficiency of the financial function of a business. Strictly speaking, this includes budgetary control, cost control, reports to management, internal auditing, etc. Thus, in establishing or reviewing a system of internal control, the accountant usually must go beyond the limits

of accounting. For example, in defining the duties of all personnel whose activities in someway are important to internal control, the accountant often must deal with shop foremen, deliverymen, shippers, and others whose duties are primarily operational. Thus, implementation of internal control, as an integral part of the accounting system, involves the interlacing of nonaccounting as well as accounting functions.

The provisions in the following five paragraphs have been set forth as essential to a sound system of internal control for a business and should necessarily be followed for implementation of the accounting system:

1) An organizational plan providing an appropriate segregation in detail of functional duties and responsibilities is necessary. The importance of establishing a sound organizational structure cannot be overemphasized. The duties of authorization, of custodianship, and of record-keeping should be separated from each other so that no one person or department, as the case may be, performs more than one function in connection with a given transaction.
2) A maximum of physical protection commensurate with the importance and nature of property or record involved. Adequate physical protection necessary for property, such as cash, inventories, and for accounting records.
3) An immediate on-the-spot record of every transaction on a prenumbered form or other irrevocable record is essential. The originator of the record and other parties to each transaction should be identified by signature or otherwise. An original record of this kind is important as objective, verifiable evidence of a transaction.
4) There should be a system of procedures and authorizations calculated to provide control over assets, liabilities, revenues, and expenses. The procedures adopted should provide a step-by-step

is then reported in detail and at the time each manager requires it for effective planning, decision-making and control. The underlying principles are:

"1) The determination of each activity carried on in the enterprise and the assigning of each item of income, expense and other expenditures accordingly.
2) The definition of the kind and amount of data each manager needs and the reflection of them in the account and statistical classification.
3) The use of management reports to convey the data to those who will use it, at the time they want it.
4) Planning and budgeting practices made fully compatible with the report.
5) The setting up of measures of performance to be incorporated in the reports and budgets.
6) Devising accounting and statistical procedures to gather and process the required data."

"Responsibility accounting is founded upon the organization structure."[38] Because of this, whether or not the organization is standardized, management must provide a logically organized business structure, and certain principles of good organization must be followed. The principles essential to a responsibility accounting system are:

"1) Each function is assigned to one, and only one unit of the organization.
2) The assignment of responsibilities is specific and understood, with no overlapping of responsibilities.
3) Each position of an organization reports to one, and only one supervisor.

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[38] E.W. Newton, "Responsibility Accounting For Better Management," Contemporary Issues in Cost Accounting, (Houghton Mifflin Co., 2nd Ed., copyright 1972) pp.408-09.

4) Establishment of a supervisory position over each logical grouping of all activities at each management level must be accomplished."[39]

A comparison of the responsibility accounting principles (pp.32-33) and organizational principles essential to a responsibility accounting system (p.33) with those provisions described for a sound system of internal control (pp.34-35), will show some similarity. This similarity, is essential for the implementation of a good accounting system which both internal control and responsibility accounting are an integral part.

Ideally, the organization itself and its processes must be thoroughly appraised, understood and altered, if necessary, before an accounting system utilizing responsibility accounting can be constructed and implemented. That is, the makeup of the system and the makeup of an organization structure are really inseparable and interdependent.[40] Thus, the responsibility accounting concept is one of the main conduits in the accounting system as an integral part of the total system.

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[39]Martin N. Kellogg, "Fundamentals of Responsibility Accounting," N.A.A. Bulletin, April, 1962, p.8.

[40]Charles T. Horngren, Cost Accounting: A Managerial Emphasis, (Prentice Hall, 3rd Ed., copyright 1972) p.157.

CHAPTER 5

BLOCK DIAGRAM INTEGRATION OF THE ACCOUNTING SYSTEM INTO THE BUSINESS

The accounting system as viewed in Chapter Three indicated the processing of transactions as an important function of the accounting system. This processing of transactions is accomplished by procedures and methods which serve as the media for integrating the accounting system into the business entity and the total system.

A procedure comprises all of the steps (processes and operations) taken in performing an important part of a system as a whole and methods are the varying ways procedures are carried out.[41]

Systems procedures and methods are sometimes identified only with the mechanics of paper work. This aspect is certainly important, but it does little more than stress a conspicuous aspect, and thereby neglects a more fundamental one. The real value of the work lies in its ability to serve the ends for which management is responsible: planning, coordination, control and protection. Thus systems procedures

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[41] Nelson and Wood, "Accounting Systems And Data Processing," p.214.

and methods may be considered as administrative tools of management.[42]

The accounting system group of procedures and methods is dependent on the rest of the business, and just the reverse of this is equally true. The distinction between accounting procedures on one hand, and nonaccounting procedures on the other, must not be allowed to obscure the interconnection of all processes.[43] This relates to the concept of the accounting system as an integral part of the total system mentioned earlier.

In the discussion concerning flow-graphs in Chapter Three, flow-charts and block diagrams were mentioned as means of visually expressing the system flow. At the same time, it was stated that the diagrams portray the various operations that the system performs upon the transactions that it processes. In the flow-chart of the accounting system, the directed branches described the flow relationship between the accounts, as the processing of transactions occurred.[44]

It is in the area of processing of transactions that the procedures and methods of the system are applied. Each of these directed branches which indicate the processing of transactions may be viewed as a subsystem of the accounting

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[42]Heckert and Kerrigan, "Accounting in Management," p.14.

[43]Ibid., p.37.

[44]Schneider, "Flow-Chart Notation," p.345.

system.

Often a procedures manual or check list is utilized for description of procedures. However, a block diagram which is a graphic presentation of related activities may be utilized for this purpose. The block diagram method of representing the processing of transactions (or subsystems) in the accounting system shows each step in the procedure, its relationship to other steps or its fit, and who is responsible for the step.

As an example, some payroll procedures are briefly described to illustrate the application. In such subsystems a number of individuals have operations to perform as shown in the following:

1) Time cards are kept on a daily basis by each employee.
2) Time cards are signed and turned in each week.
3) Time cards are reviewed and approved weekly by employee's supervisor.
4) Time is accumulated weekly, pay rate is assigned by time clerk.[45]

With just these operations as part of the payroll procedures to be followed, a block diagram may be utilized to provide the overall effect of a series of steps as is shown on Graph Number 3.

In this brief example, Graph Number 3 (page 39), the principles of the block diagram for procedures analysis is illustrated. The top portion of the block indicates the operation to be performed and the lower portion, who is to

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[45]Beckett, "Management Accounting," p.6.

GRAPH NUMBER 3

Operations in Payroll Procedures

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[46] Nelson and Woods, "Accounting Systems and Data Processing," p.34.

perform it. The line with an arrowhead indicates the form that facilitates the operation and its movement to the next operation in the procedure.

With the description of the block diagram for procedure analysis, the next step is to apply it utilizing some of the transactions identified in Chapter Three, and the organizational structure defined in Chapter Two. The procedures may be presented visually as shown in the five diagrams in Appendix I, following the Conclusion of this paper. From these block diagrams, the operations to be performed for processing the transactions; where and when they are performed; and who performs them are self-explanatory. However, there are several points about procedures and the accounting system brought out in the charts that deserve comment.

First, both administrative and accounting internal control play an important role and are an integral part in the design of procedures. In the preceding chapter, the following were listed as characteristics of a sound system of internal control: segregation of duties, a system of authorization, recording of transactions, and physical protection. From the block diagrams each of thes characteristics can be seen.

Segregation of duties may be viewed in Diagram 1, Cash Disbursement. Each of the different operations are performed by different organizations and individuals in the company. The voucher is prepared by general accounting from a comparison of the purchase order provided by purchasing and the vendors invoice and receiving report provided by shipping

the specific operations in each procedure. In Chapter Four, when discussing responsibility accounting, it was indicated that the ultimate refinement in responsibility areas is the individual worker. The diagrams, to a large part, indicate the accomplishment of this goal and its importance in the design of procedures.

Also, in regard to responsibility accounting, the gathering of data, preparation of reports and use made of these reports is important. The diagrams indicate in a number of areas, the procedures for the accomplishment of this goal. In Diagram 2, Requisition And Purchase, the price variance report is prepared from the vendors invoice and standards, by cost accounting and is transmitted to production and purchasing for their evaluation.

In Diagram 5, Transfer of Goods From Work-in-Process to Finished Goods, cost accounting prepares a variance report from its accumulation of job order costs against standards and transmits it to production and assembly for their evaluation. Although the diagrams are certainly not all-inclusive in this area, they do indicate the nature of information collected, procedures for collection, who holds areas of responsibility and areas where reports are necessary.

Third, in Chapter Four, it was indicated the similarity of internal control and responsibility accounting as integral parts in the accounting system. This point is emphasized by the block diagrams of the procedures for integration of the accounting system into the business.

When looking at the diagrams, it becomes difficult to say, "This is internal control," and "This is responsibility accounting." As an example, the assignment of operations to the individual is necessary for the safeguarding of assets in internal control, and is necessary for establishment of cost responsibility in responsibility accounting.

The characteristics of systems are apparent in block diagram portrayal of the accounting system procedures. The cyclical nature, although not obvious because each procedure in the processing of transactions is a separate block diagram, is still present. The separate procedures are tied together by first the accounting "T" flow and secondly by operations that overlap from procedure to procedure. An example of the latter is that purchase orders are used in both cash disbursement and requisition and purchase procedures.

Information collection, another function of systems, is present throughout the diagrams. Control, a third characteristic of systems is eminently present and was discussed earlier in relation to internal control. It was also indicated that systems cut across organizational lines. The block diagrams exemplify this characteristic.

Several times before it was mentioned that the total system concept is the object of systems work. The block diagrams of procedures for the accounting system indicate that in design and implementation of a system, total involvement of the business would probably be hard to avoid

and an effort would have to be made to isolate the accounting system from other subsystems in a total system.

An excellent example of this would be Diagram 2, Requisition And Purchase. As in Diagram 2, the initiation of a purchase requisition, a procedure in the accounting system necessary for a puchase order, requires an assembly schedule and materials inventory records. The assembly schedule may be part of a detailed production reporting and scheduling system. Further, to prcduce the assembly schedule, a sales schedule and finished goods inventory records are needed. The sales schedule could possibly be part of a sales forecasting and analysis system. The finished goods inventory records would be part of the inventory control system. This exemplifies the total involvement of the systems in the business entity and the accounting systems part in the total system concept.

CONCLUSION

The conclusion is not to be a summary of the paper but rather some comments on it, what was learned and the thought process involved in developing it. Initially, the basic idea of an investigation of systems and accounting was established, but the tying together of the approach to be used was not determined.

A number of articles and books on systems were read and it became apparent that systems require a problem-solving approach. This was, in fact, pointed out in Heckert and Kerrigan, Accounting Systems: Design And Installation, where they state, "Every system project goes through four successive steps or phases--survey, design, installation, and follow-up." The problem-solving approach then, became the basic outline for the paper.

Also, as it was started and throughout the paper, cohesiveness was a major concern. As the paper was written, one discovery was that congruity is demanded by systems and as it progressed, it became apparent that each part related to the total concept. This pervades throughout the paper.

Another characteristic of systems that was realized is that it is all-encompassing and involves the entire business entity. If attempting to analyze just the accounting system, it is difficult to isolate from other parts of the business organization and other subsystems of the total system.

As was pointed out several times in the paper, the accounting system is actually a subsystem in a total systems concept. This, in one way, created the problem of how to cover certain areas without becoming overly-involved, and yet not cutting it off too quickly.

As stated in the introduction, the purpose has been to gain a better understanding of systems approach to accounting and internal control as it applies to the functional business situation. By following the problem-solving approach, this goal has been accomplished.

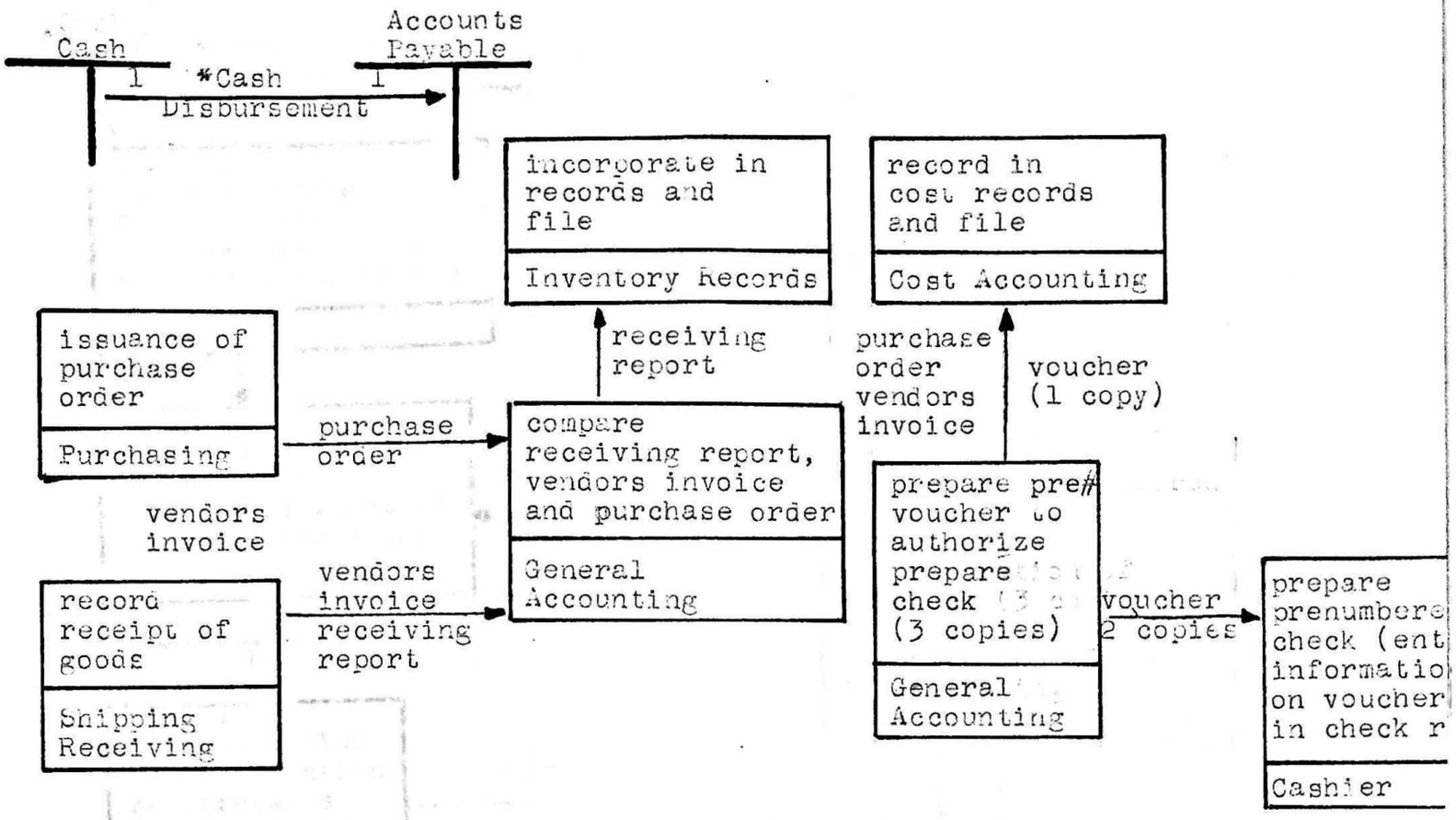
APPENDIX I

Diagram 1) Cash Disbursement
Diagram 2) Requisition And Purchase
Diagram 3) Sale of Inventory
Diagram 4) Requisition of Materials to Work in Process
Diagram 5) Transfer of Goods from Work in Process to Finished Goods

APPENDIX I

Diagram 1) Cash Disbursement
Diagram 2) Requisition And Purchase
Diagram 3) Sale of Inventory
Diagram 4) Requisition of Materials to Work in Process
Diagram 5) Transfer of Goods From Work in Process to Finished Goods

DIAGRAM NUMBER 1[47-48]

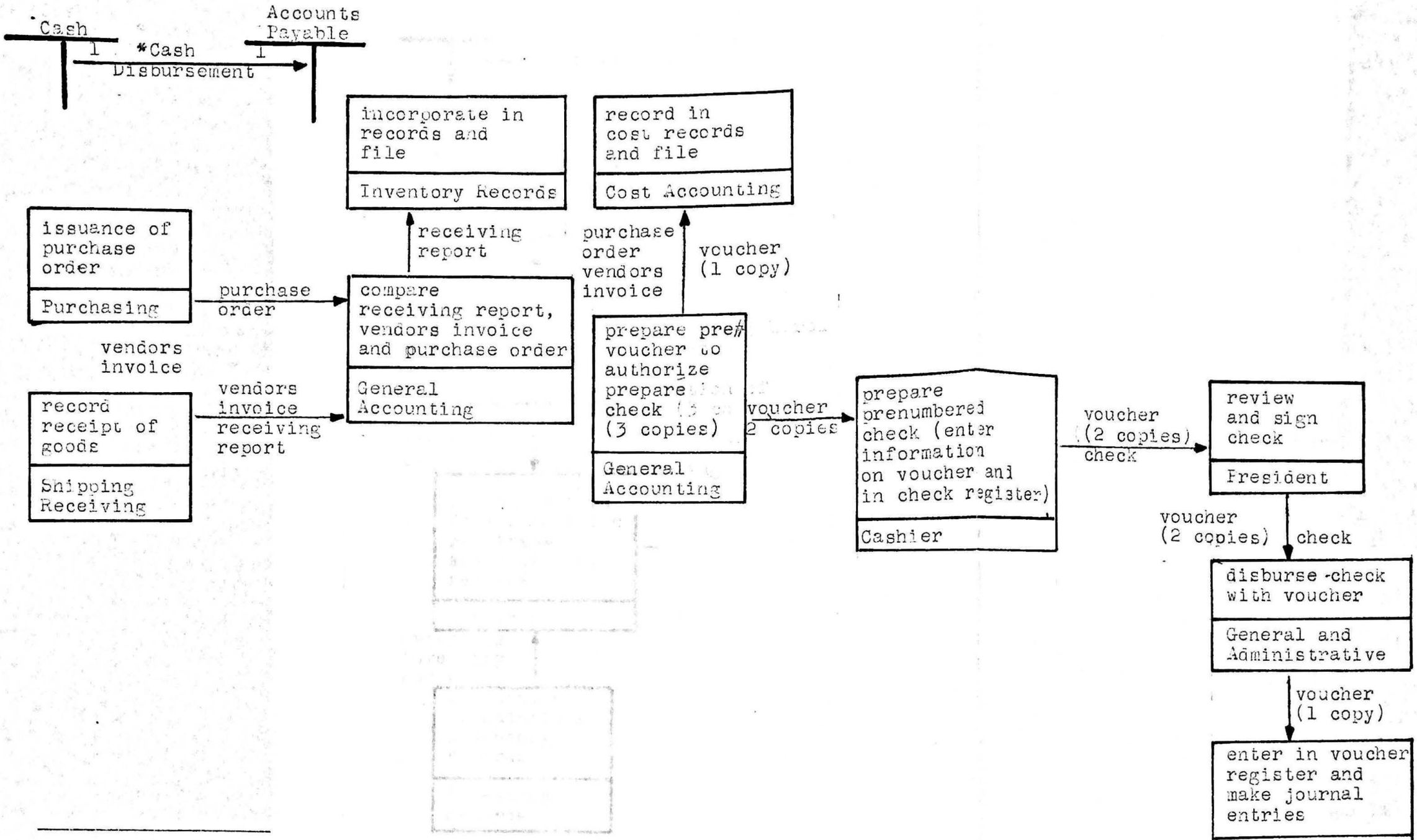


*Accrued and current cost items to be paid, not indicated for sake of simplicity.

[47]Adolph Matz, Othel J. Currey and George W. Frank, Cost Accounting, (Southwestern Publishing Co., copyright 1967), pp.85-89.

[48]Heckert and Kerrigan, Systems: Design and Installation, pp.281-306.

DIAGRAM NUMBER 1[47-48]

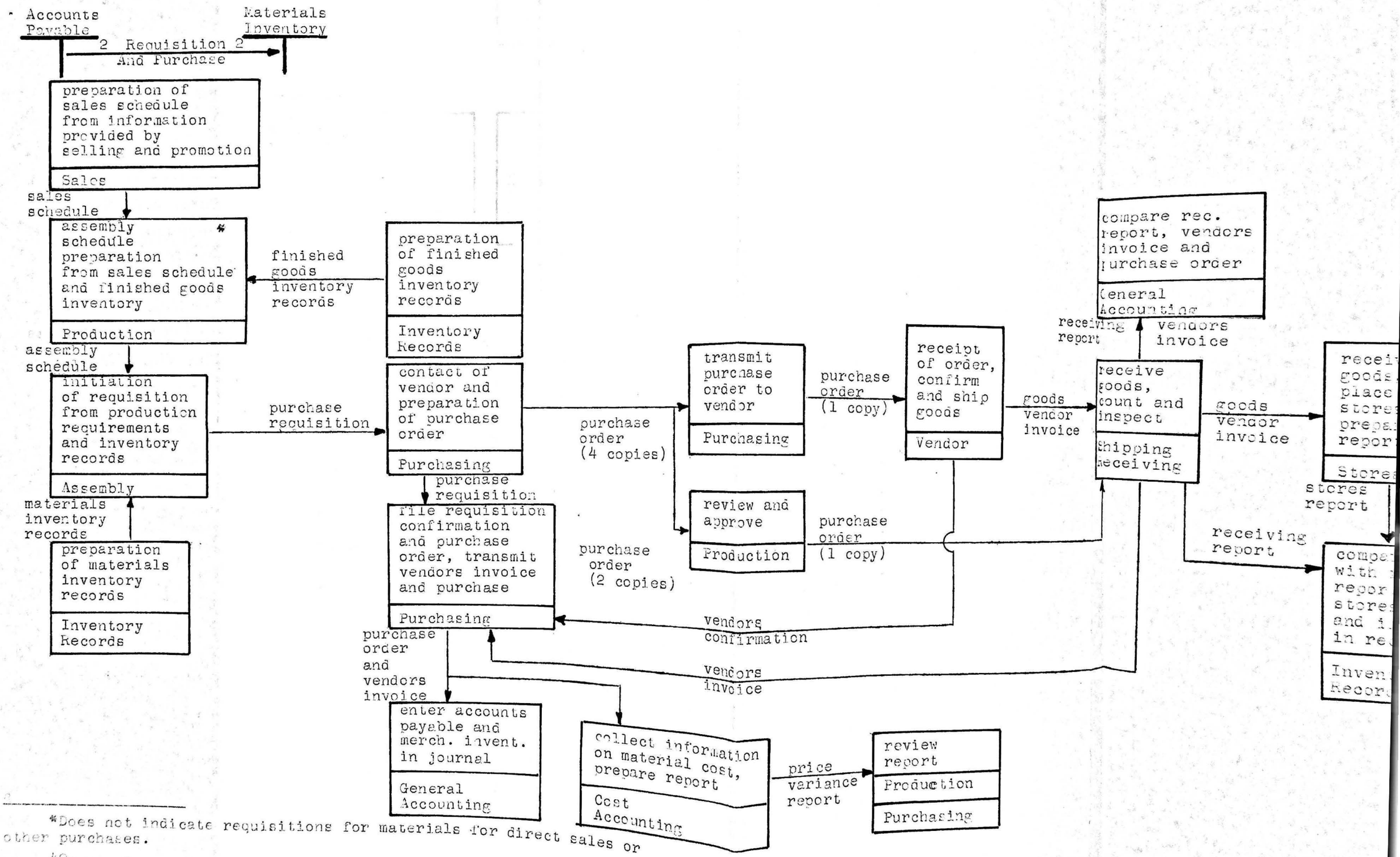


*Accrued and current cost items to be paid, not indicated for sake of simplicity.

[47]Adolph Matz, Othel J. Currey and George W. Frank, Cost Accounting, (Southwestern Publishing Co., copyright 1967), pp.85-89.

[48]Heckert and Kerrigan, Systems: Design and Installation, pp.281-306.

DIAGRAM NUMBER 2[49-50]

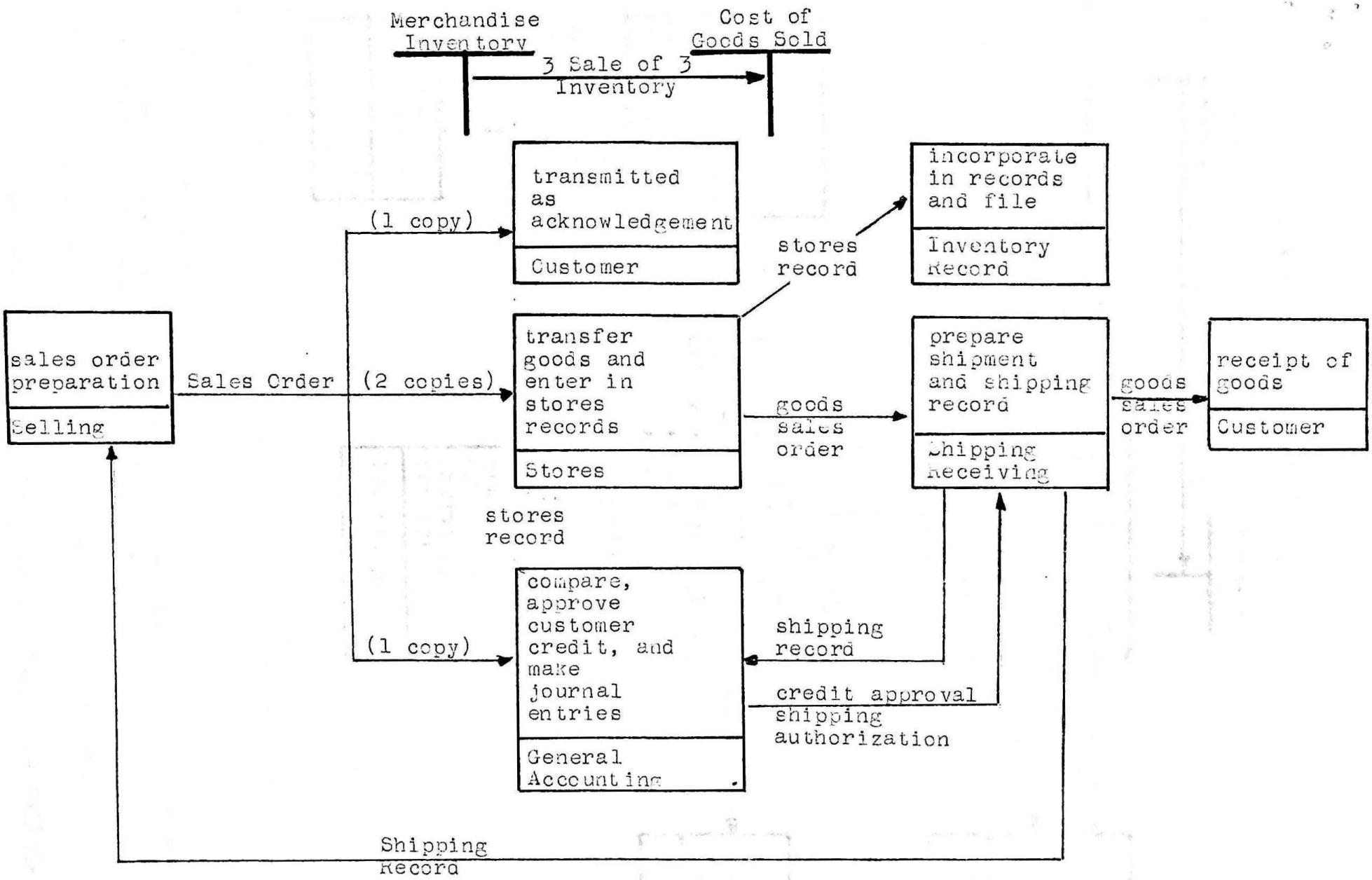


*Does not indicate requisitions for materials for direct sales or other purchases.

[49]Matz, Currey, and Frank, Cost Accounting, p.236.

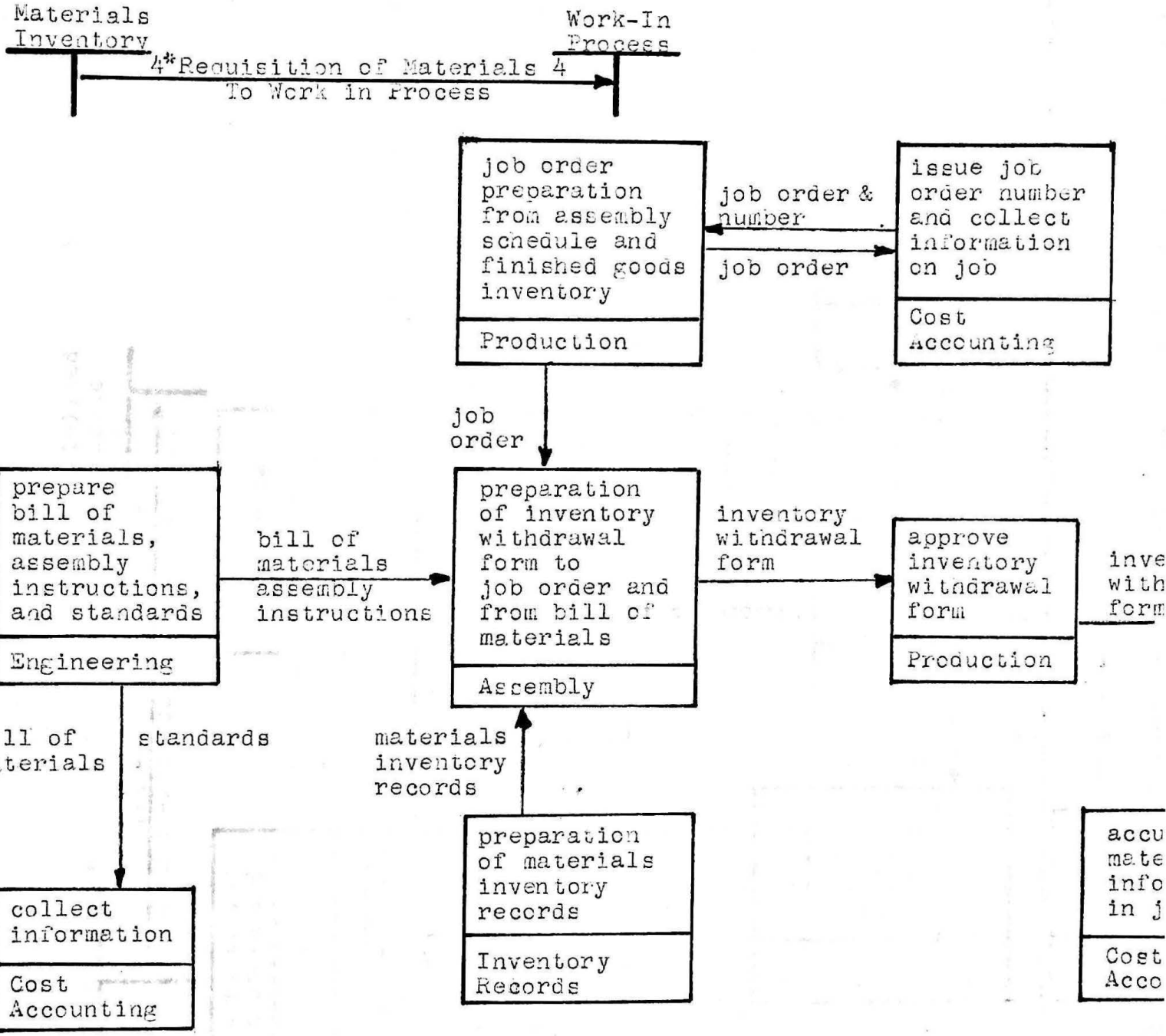
[50]Heckert and Kerrigan, Systems: Design and Installation, pp.254-280.

DIAGRAM NUMBER 3[51]



[51]Heckert and Kerrigan, Systems: Design And Installation, pp.157-173.

DIAGRAM NUMBER 4[52-53]

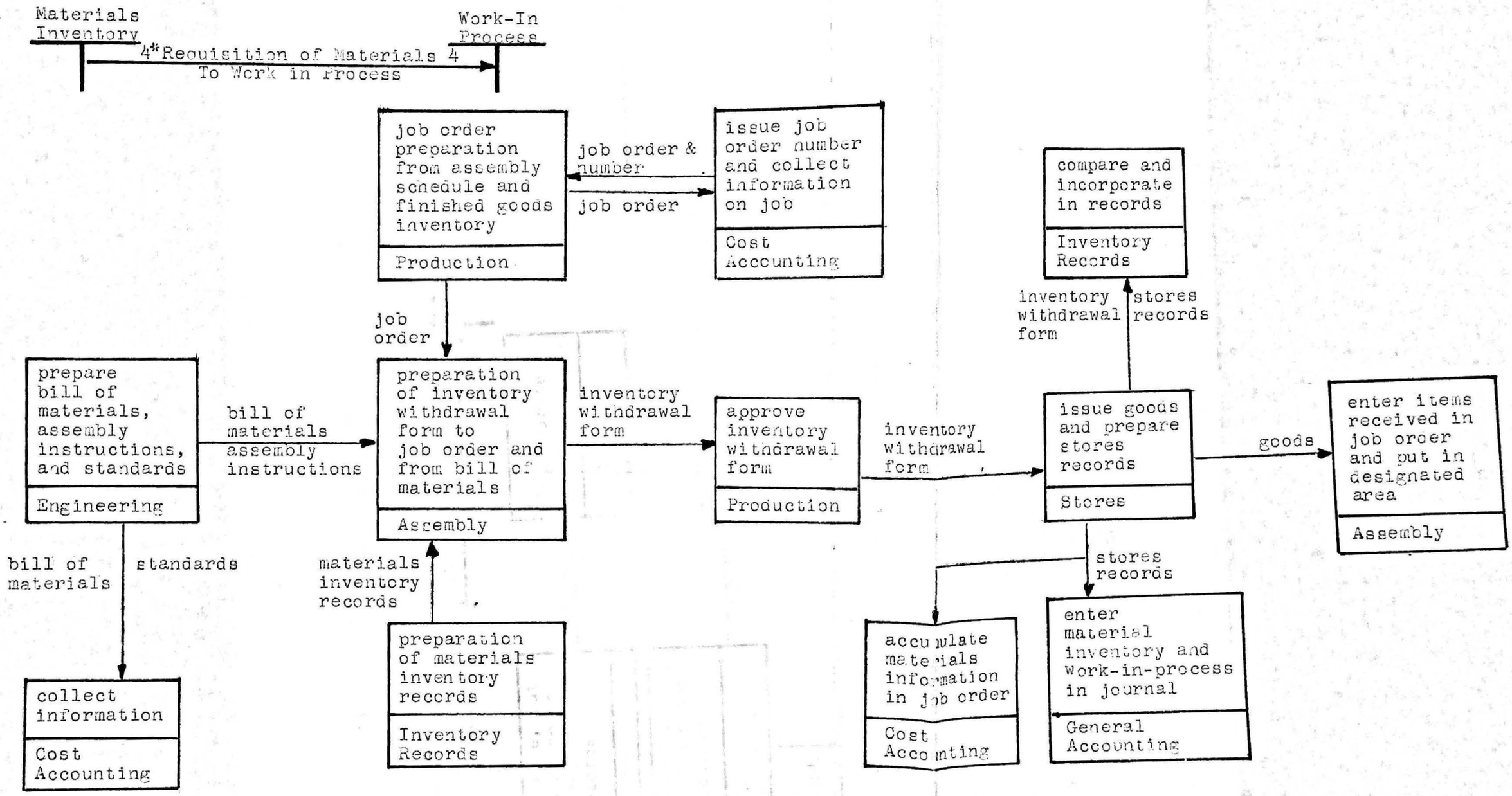


*Indicate only requisition from materials inventory and does not include direct requisition for purchase.

[52]Matz, Currey, and Frank, Cost Accounting, p.244.

[53]Heckert and Kerrigan, Systems: Design and Installation, pp.358-360.

DIAGRAM NUMBER 4[52-53]



*Indicate only requisition from materials inventory and does not include direct requisition for purchase.

[52]Matz, Currey, and Frank, Cost Accounting, p.244.

[53]Heckert and Kerrigan, Systems: Design and Installation, pp.358-360.

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