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Management by System

MANAGEMENT BY SYSTEM

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Second Edition

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MANAGEMENT BY SYSTEM

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To Jean, Robin, and Debra

PREFACE TO THE SECOND EDITION

In the ten years since the first edition of this work was published under the title "Streamlining Business Procedures," the systems and procedures function throughout American business and government has grown greatly in size, in the significance of its contribution, and in the recognition it has earned from top management.

Some measure of this growth can be found in the following facts:

1. A recent survey made by the American Management Association reveals that today virtually every one of our large companies, 85 per cent of the medium-sized ones, and more than half of even the small ones have either a full-time person or a whole staff whose main responsibility is that of improving the organization's systems and procedures.

2. The Systems and Procedures Association of America, founded in 1947, has—within the past decade—grown from an organization of 9 chapters to one of 63 chapters in the United States and Canada.

3. Courses in systems and procedures design and closely related subjects are now offered by over one hundred American colleges and universities. Similar educational opportunities are offered by a number of other organizations. Illustrative of these are the permanent "Systems and Procedures Course" given at the American Management Association Academy and the "Systems Engineering Course" of the United States Air Force School of Logistics.

One does not need to look far for convincing explanations of this rise in interest and importance.

First among them is the continued growth in size and complexity of business organizations themselves. In the face of decentralization, merger, and diversification, professional managers have developed an increasing awareness of the role that soundly conceived systems and procedures can play in modern business management. They

have come to recognize that behind customer complaints, lack of control, poor policy execution, and interdepartmental conflict one is almost sure to find cumbersome, inadequate, or unnecessary systems and procedures.

Closely related as a second underlying cause is the spiraling cost of performing the paper work of today's business and governmental organizations. The significance of this element is underscored by the fact that, in recent decades, the nation's clerical employees have grown in number about five times faster than the labor force as a whole.

A final major cause is the advent of the electronic computer and of integrated data-processing techniques. These have required the development and application of new approaches not only to systems design itself, but also to structuring the organization for carrying out the whole paperwork function.

To keep pace with these trends and developments in the systems and procedures activity, this revision contains wholly new chapters on three key subjects. First among these is Chapter 11, which outlines an approach to the development of an integrated system of management reports that facilitate the decision-making and control processes. Next, Chapter 12 covers the method of carrying out an electronic computer feasibility study and of avoiding the most common types of mistakes that have been made in the application of this powerful new tool. Chapter 14 treats the subject of integrated data processing by defining the term, describing a number of representative applications, and setting forth an approach to the development of IDP applications.

In addition to these new chapters, much of the material appearing in the first edition has been revised and supplemented. Among the subjects to which the most substantive revisions have been made are the following:

1. The major obstacles to systems and procedures improvement work and what can be done to overcome them.

2. How to organize, administer, and control the systems and procedures staff effort.

3. The top-management approach to systems and procedures analysis. This material, in particular, is aimed at helping the systems and procedures staff man to be a broad-gauged administrative analyst and problem solver instead of just a technically oriented "machine man."

Finally, a word of explanation is needed for the change in the title of this work. The new title, "Management by System," is simply a reflection of the growth in significance of the systems and procedures function that has been taking place. No longer merely a matter of office routine or paperwork mechanics, business systems and procedures are, today, one of the major administrative tools through which large-scale enterprise is operated and controlled.

As was true of the first edition, the thinking and experience of many of my associates in McKinsey & Company is reflected in this revision. In addition, I acknowledge particularly the substantial help that Douglas Axsmith and Ronald Daniel gave me in preparation of the chapter on electronic data processing. I am also greatly indebted to Miss Kay Glavin for her help in reading proofs and preparing the Index.

Richard F. Neuschel

PREFACE TO THE FIRST EDITION

In his book, "The Social Problems of an Industrial Civilization," Elton Mayo states: [1]

In modern, large-scale industry the three persistent problems of management are:

1. The application of science and technical skill to some material good or product.
2. The systematic ordering of operations.
3. The organization of teamwork—that is, of sustained cooperation.

"Streamlining Business Procedures" is concerned with the development of a logical, organized, top-management approach to the second of these "persistent problems of management." Its principal theme is that the continuous simplification, strengthening, and adaptation of business procedures are major requisites for the achievement of a "systematic ordering of operations."

Much of the book is aimed at answering the "why" and "how" implicit in this central theme.

In its answer to the first question, the book seeks to spread an understanding of the vital part procedures play in modern business management. It treats procedures not as mere matters of paper-work mechanics or clerical detail, but as one of the basic administrative techniques through which the complex business organization acts and by which it controls and coordinates its actions. This broad perspective emphasizes the far-reaching benefits that can be realized from an intelligent and continuing effort to improve business procedures.

In answering the "how" of streamlining procedures, the book discusses the principles of organizing, planning, and administering a

[1] Elton Mayo, "The Social Problems of an Industrial Civilization," Division of Research, Graduate School of Business Administration, Harvard University, Boston, 1945, pp. 69–70.

procedures program as well as the methods of attacking individual procedures studies.

In light of this statement of scope, the book is designed for three types of readers.

First is top operating management, which must take the initiative in launching the procedures development and improvement program. This is the group that must see that the problem and the opportunities it holds are recognized, that sound objectives and policies are established, that the correct organization is set up to handle the program, and that the endeavor is efficiently administered.

Second are the line supervisors of the organization. Regardless of the type of business or the activity being supervised—whether it be order processing and invoicing, purchasing, accounting, production or inventory control, or any other—one of the intrinsic functions of supervision is to determine the procedures and methods by which the responsibilities attached to the position are to be carried out. Among the objectives of this part of the book are to create an awareness of how effective procedures can facilitate the supervisor's job and how the procedures of each unit must be integrated with those of all other groups comprising the organization.

Finally the book is directed to the staff specialists who are engaged more or less continuously in procedures analysis and improvement work. In the past decade this group has grown rapidly in numbers, and its function has been given formal recognition in the organization structure of many American companies. For these practitioners the book seeks to develop a fundamental approach to or a way of thinking about procedures problems. This material includes a body of practical, tested techniques for carrying out procedures studies as well as some basic rules of conduct for handling the varied human relations phases of the work.

Grateful acknowledgment is given to my many associates in McKinsey & Company whose thinking and practice in the solution of business problems have had a very real impact on the substance of this work. Particular appreciation is expressed to Howard C. Adams and Ewing W. Reilley, who read the original manuscript and contributed many valuable suggestions as well as generous encouragement. In addition, I am greatly indebted to Mary Skemp Perkins for her excellent work in editing the manuscript, reading proofs, and preparing the Index.

Richard F. Neuschel

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Part One

THE CASE FOR A "SYSTEMATIC ORDERING OF OPERATIONS"

Chapter 1

THE ROLE OF PROCEDURES IN BUSINESS MANAGEMENT

Of all the persons employed in American business today, one of the largest occupational groups neither produces nor sells the products or services of its employers. This is the army of administrative labor performing the so-called "paper work" of business—an army made up of clerks, stenographers, and office-machine operators; of accountants, bookkeepers, programers, and statisticians; of schedulers, expediters, checkers, messengers, and so on.

Back in 1870, which marks the beginning of our shift from an agricultural to an industrial economy, about 80,000 of the nation's workers were engaged in clerical occupations. In the 90-year period since then, perhaps one of the most significant changes in the social-economic distribution of workers has been the constant and rapid increase in the ratio of these clerical employees to the total workers of the country. During this period, while the total of those gainfully employed was increasing about five times, the clerical group multiplied itself over one hundred times.

The 80,000 clerical employees in 1870 represented less than 1 per cent of the nation's workers. By the turn of the century, this percentage had risen to 2.5, by 1910 to 4.6, and by 1930 to 8.2. Today, on the basis of the most recent census, the figure probably stands above 14 per cent and is still growing. This means, in absolute figures, that of the nation's 65 million workers, over 9 million are engaged in the clerical activities of modern business.

Nine million people are difficult to visualize, particularly as a segment of our business community and not of our total population. For that reason, let us think of the relative importance of this occupational group in these terms: 9 million people are just about ten

times the number of persons of all occupations working in the nation's textile industry; over six times the total workers in food-processing industries; more than eight times those employed in our chemical and petroleum industries; almost three times more than the total employees in our transportation and communications industries; and over 50 per cent more than all the workers in our metal, machinery, automobile, and aircraft industries combined.

This phenomenal growth of administrative labor, both in numbers and in ratio to production labor, gives us cause to inquire into the role that this group plays in modern business management. What function do these people perform, these 9 million who, in a sense, neither "toil" nor "spin"—these workers who neither produce their company's product nor sell it?

If, in seeking an answer, we were to follow a specific customer's order through the various departments of a manufacturing company, we might come first upon a clerk entering the order in a register and then upon a credit man checking his records to determine the company's previous credit experience with the customer. Next we might watch an order interpreter converting the customer's purchase specifications into nomenclature readily understood by the personnel responsible for filling the order. From the interpreter's notes, a typist would type the order on a standard form, copies of which would then be distributed to many points throughout the company. One copy would likely be routed to the engineering department as notice to furnish blueprints and a bill of materials to the factory. Another copy would flow to the production control department where, in our wanderings, we would see a clerk scheduling the order and sending a delivery-promise date to the sales department for transmission to the customer. At other points we would watch clerks determining material requirements from bills of material and filling out purchase or stock requisitions; dispatchers releasing work orders and operation sheets; clerks posting production progress records and machine-load charts; correspondents answering the customer's inquiry regarding the status of his order; timekeepers issuing and collecting timecards and calculating elapsed times; inspectors recording the results of their inspection and filling out scrap tickets; and finally typists preparing shipping papers and an invoice to the customer.

And then, to support or control this basic, serialized process, we would find a whole host of ancillary activities feeding or flowing from

it. There would be purchasing department buyers referring to purchase history records and typists filling out purchase orders or receiving slips. There would be clerks recording receipts or disbursements on inventory control cards, pricing stock requisitions, checking suppliers' invoices, preparing payrolls, and computing salesmen's commissions. There would be accountants accumulating material, labor, and factory burden charges against the job. Finally, we would see the results of the sale and of the effort required to fill the order being incorporated in the various reports constituting the company's management information structure—production volume reports, worker efficiency reports, sales reports, product cost reports, financial statements, and so on.

If we were to extend our observation to other types of businesses, we would find much the same picture—whether bank or brokerage house, insurance company or department store, public utility or common carrier. Perhaps the most marked difference we would encounter in these other businesses is that, in many of them, clerical activity becomes an even greater part of the whole function than it was in our hypothetical manufacturing company. Indeed, in some of them, such as banks and insurance companies, clerical labor becomes very nearly the entire means for performing all the business of the enterprise.

It is true, of course, that the precise nature of the clerical operations performed and the form of the documents used would vary from one type of business to another. Invoices to customers might be replaced by premium notices to policyholders or bank statements to depositors. Production volume reports might be replaced by reports of freight tonnage carried. The normal receiving and invoice verification procedures would, in department and specialty stores, be supplemented by merchandise marking. But, throughout all these businesses, the mechanics of the clerical work carried on and, perhaps more significant, the fundamental purposes of this work would remain much the same.

Essentially, these nonproduction workers in all types of business are engaged in preparing, sorting, checking and distributing, posting, analyzing, and filing a tremendous variety and volume of forms, records, and reports. The performance of these activities has become known variously throughout American business as procedures, systems, clerical routines, or paper work.

THE FUNCTION OF PROCEDURES

In every business there exists some such network of clerical processes, written or unwritten, simple or complex, carefully developed or casually improvised. These are the activities which business executives, often with considerable justification, are quick to deprecate as "red tape"; but without them no business of any size could operate.

Procedures are the means by which all repetitive business action is initiated, carried forward, controlled, and stopped. It is through forecasting and budgeting procedures that financial and operating plans are developed; through purchasing procedures that materials are procured; through employment and transfer procedures that the labor force is recruited and utilized; through order-processing procedures that the manufacturing process or the shipment of finished goods from stock is initiated; through production planning, scheduling, and dispatching procedures that men, materials, and machines are coordinated; through material control procedures that investment in inventories and losses from obsolescence are minimized; through inspection procedures that qualitative standards are applied to the product and its components; through accounting procedures that the information required for control of costs, profits, and assets is gathered, summarized, and reported.

These are but a few of the activities carried on day after day in a manufacturing enterprise. They are sufficient, however, to show that the procedures performed by nonproduction personnel are among the basic tools which make it possible for management to manage. They are the mechanism through which action and control are achieved. They are the traffic laws and signals governing the form, the direction and rate of movement, the stopping places, and the ultimate destination of each instruction and piece of information through which today's complex business enterprise functions. They make control possible by providing for inspection and recording of performance and by specifying the performance data to be submitted to the managerial group.

Because these procedural activities are performed by clerical personnel and because they involve paper work rather than production operations, a pervasive misconception exists that procedures are peculiar to the office. This, of course, is not true. The notion persists,

however, with the result that too many companies have taken an unrealistic and ineffective approach to the task of streamlining procedures.

Perhaps the most marked characteristic of procedures as an administrative tool is their widespread application. They are not purely an office phenomenon, in terms of either participants or areas affected. They are no more restricted to the office than are policies, organization charts, or any other administrative tool. They play a vital role in the operation of every department and in the performance of every function of a business. We have seen, for example, that paper work is an integral part of the production process—that by governing the flow of materials and tools it determines how effectively men and machines are used. The forms prepared and records maintained by shop clerks, schedulers, storeskeepers, or receiving clerks are just as much a part of the company's action and control pattern as are sales orders, cost sheets, help requisitions, or budget reports.

It should be recognized, however, that the role of procedures in carrying on the activities of a department varies considerably from function to function. For example, a smaller part of the personnel in the sales and industrial relations departments is generally engaged in procedural routines than is true in the accounting or production control departments. In the latter departments, procedures and record keeping are so great a part of the whole that these functions become known as the accounting *system* and the production control *system*. But whatever the department—however much judgment, planning, administrative skill, or technical knowledge is required; however variable and nonrepetitive its activities—a significant part of its work will always require established routines for getting things done in a prompt, orderly, and consistent manner.

Procedures and top management. In considering the role of procedures up to this point, the emphasis has been on facilitating and controlling the work of the various functional groups comprising the business. But procedures play as significant a part—though perhaps a less perceptible one—in the affairs of top management as they do in the performance of the departmental or divisional functions.

1. *The formulation and continuous reappraisal of major plans and policies* are well-recognized top-management responsibilities. But plans and policies are rarely self-executing. Their implementation generally requires the careful development and installation of procedures that will ensure timely and effective execution. Let us suppose,

for example, that it is the policy of a given company to compete on a specialized-merchandise, customer-service basis. Any such policy would be meaningless unless the company's scheduling and expediting procedures and its production progress records were all closely related to customers' orders. A personnel policy to upgrade from within the organization and to achieve the highest and best use of existing manpower could hardly be administered effectively without the development and maintenance of an inventory record of personnel skills and experience.

Yet many soundly conceived policies fail in execution because members of top management tend to regard the promulgation of policy as the fulfillment thereof. They fail to visualize the size of the gap that lies between decision and implementation. Many a program of budgetary control, for example, has been abandoned because it proved to be cumbersome and unduly expensive and furnished data so historical that its control value was lost. Almost without exception, the reason for the breakdown of such administrative plans is the failure of executives to give adequate thought to the practical operating problems involved in carrying out the plan—to the best method for preparing the budget estimates, to the form and arrangement of data, to the time and cost of gathering and correlating performance information, to the speed with which the revised and additional work could be assimilated by the operating organization, and so on.

Thus, in a very practical sense, the full effectiveness of key executives is realized only to the extent that orderly, efficient procedures are developed through which operating personnel can convert static plans and policies into a living administrative force.

2. *The exercise of control* to ensure that the company's objectives and plans are achieved is another traditional responsibility of top management. Here again procedures play an enabling role. They specify the form, substance, and frequency of information essential to the exercise of this control and they provide the channels through which it flows to the top-management group.

3. The final function which procedures perform as an instrument of top management is that of facilitating *coordination of effort among the functional groups* so that the best interests of the enterprise as a whole are served. The development of every procedure requiring participation by more than one department or division of the company is fundamentally a means of promoting this coordination. The full extent to which procedures serve this purpose will be covered in suc-

ceeding chapters. It will suffice to point out here that procedures achieve coordination among departments by prescribing the nature and timing of each group's participation in a common process.

Summary. In the framework of administrative processes, procedures play a major role in the execution, coordination, and control of all business activity. How well they are designed will have a very real impact on operating costs, production speed, quality of service rendered to customers, and over-all effectiveness of the business. Soundly conceived and continuously adapted, they will do much to ensure the "systematic ordering of operations" of which Mayo writes. Improvidently developed and permitted to grow unattended, they will produce only waste, confusion, and delay. As another writer states, it is the difference between "lifeblood" and "sleeping sickness."

PROCEDURES, METHODS, AND SYSTEMS

Business literature and day-to-day business practice refer to the field of clerical activity in various ways. In some companies, the terms "systems," "procedures," and "methods" (or "office methods") are used interchangeably; in others, only one or two, but not all, are in common usage. Between companies the terms are even less useful as referents, for each means something quite different in the vocabulary of each company.

It is necessary, therefore, to the understanding of this book that a clear distinction be made among these terms. It is to be hoped that this exercise in semantics will stimulate others to contribute toward development of definitions that ultimately gain general acceptance.

1. A *procedure,* as used here, is a sequence of clerical operations, usually involving several people in one or more departments, established to ensure uniform handling of a recurring transaction of the business. A procedure specifies, either in writing or by custom,

   a. *What* work is to be performed by the various participants.
   b. *Who* those participants are.
   c. *When* the various steps in the process are to be performed, that is, their order and timing.

2. *Clerical methods* (or *office methods*), on the other hand, are the manual or mechanical means by which individual clerical operations are performed. Thus "methods" have to do with *how* work is performed, not with what work is to be done, who will do

it, or when. For example, messengers and pneumatic tubes are methods of transporting documents. Billing machines, automatic calculators, and key-driven computers are mechanical methods of extending invoices. Punched-card equipment is a mechanical method of sorting, listing, and summarizing.

3. A *system* is a network of related procedures developed according to an integrated scheme for performing a major activity of the business. Thus, the production control system, for example, consists of scheduling procedures, material requisitioning procedures, dispatching or routing procedures, progress recording and control procedures, and so on. Similarly, the accounting and material control systems each comprises many related procedures.

Chapter 2

THE PAY DIRT IN PROCEDURES ANALYSIS

Some years ago, Alfred P. Sloan, then president of General Motors Corporation, wrote in a statement to stockholders:

> Experience has demonstrated that the day-to-day problems that confront the Corporation's operating executives are so absorbing in their demands of time that too little opportunity is afforded for . . . the development of a better operating technique, which requires much study and research. The importance of research work as contributing to the advancement of industry through scientific study is well established. The marvellous contribution that it has made to the progress of industry and the advancement of the standard of living, is universally accepted. It is not so generally recognized, however, that research may be equally well applied—and it is important that it should be applied—to all functional activities of a business.

It is a fundamental premise of this book that the application of organized, intelligent, and continuing research to business procedures offers an almost unparalleled opportunity to improve the effectiveness of the modern business organization. This is held to be true for two reasons:

1. The fruits of such research can be extraordinarily abundant and varied. They cannot be weighed solely in terms of clerical cost reduction, as is so commonly supposed. Their full measure must include the increased efficiency of the entire organization that results from the rendering of faster, more reliable service by the clerical group. The widespread application of procedures produces equally widespread benefits from their systematic improvement.

2. The improvement of procedures and clerical methods still represents a vast, relatively unexploited opportunity throughout American business. Application of scientific management techniques to factory operations has become commonplace. What began 50

years ago as elementary motion analysis at the workplace has expanded in many companies to a full-fledged program for continuous and systematic analysis of manufacturing processes, tools and machines, flow of work, layout, and materials handling methods.

But the efforts to improve business procedures have not advanced nearly so far. To be sure, in recent years, many companies have launched formal systems and procedures programs. Most of these programs, however, have only begun to tap the profit potential that lies in the paper-work area. In other companies which do not yet have formal improvement programs, the procedural processes receive only sporadic attention, and that is ordinarily given only under the stimulus of office equipment salesmen, cost-reduction drives, or a breakdown in the services rendered.

WHY PROCEDURES RESEARCH PAYS OFF

Recently the author had occasion to talk with the president of a moderate-sized but rapidly growing company about some of the problems arising from the expansion of his business. This was the executive's lament:

> I don't have time today to do the president's job because I'm too busy worrying about our office operations. Our collections have fallen off because we're behind in billing. And after the bills are sent out, we get a lot of customer complaints because of billing errors. The service we give our customers isn't competitive either. It takes us as long as a week to push an order through our office and into the stock room. In addition, we're doing a lot of unnecessary and expensive back ordering because our stock records aren't accurate.
>
> On top of this bad performance, our office costs have risen out of all proportion to the increase in our volume of business. We've been putting in a lot of overtime work in the office, and our clerical turnover is the highest we've ever experienced.
>
> These conditions have taken such big bites out of our profits and have resulted in so much customer ill will that I just can't afford to think about developing new products or entering new markets until we get the muddle out of our paper work.

Subsequent investigation showed that the procedures of this business just had not kept pace with the company's growth. No conscious effort had been made to adapt them to new requirements and larger volume. The results were that improvisation and expediency became

the accepted practice, and the procedures themselves grew by accretion into complex, time-consuming error traps.

The experience of this company is, unfortunately, not unique. It serves, however, to highlight a number of the benefits that can be realized from a soundly conceived and skillfully executed program of procedures development and improvement. These benefits are worth detailed enumeration because all but the most obvious are so frequently lost sight of. Yet, the least obvious are often the most fruitful.

Reduction of clerical costs. The 9 million people engaged in clerical work constitute one of the largest elements of overhead expense in American business. It is understandable, therefore, that cutting clerical costs has become the most widely recognized benefit of procedures research. Not so generally recognized, however, are the magnitude of the potential saving, the diverse ways in which it can be obtained, and its full implication for profit building. Here are some of the facts that must be spotlighted if anything approaching the full, realizable saving is to be achieved:

1. *In many companies, opportunities for labor saving through work elimination are greater in the clerical field than in any other part of the business.* The work performed by *direct* labor is specified, limited, and purposeful. What is to be done and where it is to be done are controlled by operation or routing sheets. The way it is to be done and even the time required are controlled by set-up instructions, by jigs and fixtures, by automatic machines, and by standard time allowances.

This is not so in clerical operations. The determination of what is to be done is the product of a hundred minds—executive, supervisor, and operator—all with widely varying sensitivity to value-cost relationships. Within most organizations of any size, requests for information, desire for protection, ignorance of what is done elsewhere, worker preference, and extemporizing to meet changing conditions—all work to produce a monumental structure of uncoordinated activities, forms, records, and reports. And concealed within this complex structure, duplication, excessive control, and unnecessary operations go unnoticed. Nor does this process of accretion ever stop if left unattended. It continually feeds upon itself as its very complexity produces the need for more and more control.

Some measure of the opportunity for work elimination that exists within this structure can be found in the experiences of two organiza-

tions which undertook an analysis of various segments of their clerical routine.

In the first company, investigation of various personnel change procedures revealed the following statistics on volume of paper work and clerical operations:

Procedure	Number of departments involved	Number of clerical and transportation operations	Number of forms
Hiring	9	86	20
Employee transfer	10	112	7
Employee release	9	113	7

The effort to streamline these procedures resulted in elimination of 70 per cent of the clerical and transportation operations, 12 forms, and 3 records.

The second company, employing about 5,000 direct workers, made a number of basic changes in product line and type of customer served. These changes were handled by superimposing new production control records and routines on the old structure. The additional work, of course, led to an increase in the department's personnel complement. By the time its growth was halted and the pruning process begun, the department had mushroomed to almost 400 members, or approximately 1 clerk for each 12 production workers! After analyzing its routines and adapting them to the new product line and manufacturing methods, the company was able to eliminate, over the period of a year, one-third of the department's records and one-half of its clerical operations.

2. *Reductions in clerical labor can be achieved by many means other than work elimination.* The development of simple, efficient, easily understood procedures is the first step in increasing the productivity of individual clerical employees. This contribution is made in many ways. Direction and certainty are substituted for confusion and lost motion. Training is facilitated and supervision becomes more effective. Volume of work is more predictable and its flow more easily controlled. Thus, accurate scheduling of work becomes possible, and idle time beyond the workers' control is minimized. The improved methods developed for performing essential clerical operations enable the operator to turn out more work in less time. Finally, established standard procedures make possible the development of quantitative

performance standards, incentive compensation systems, and similar techniques for controlling and increasing productivity.

3. *The size of the potential clerical labor saving through procedures analysis is enormous.* During a recent cyclical decline in business activity, one metalworking company with annual sales of about $17 million experienced a sharp drop in profits as the effect of overcapacity in the industry began to make itself felt. At that point the company undertook a fundamental, profit-conscious attack on its overhead costs—80 per cent of which were accounted for by the salaries of administrative, technical, and indirect factory personnel. It was not a disorderly, panic-driven retreat, but a thoughtful, businesslike evaluation of what activities were clearly essential or profitable and how many people were needed in each of them to achieve the best balance between results produced and the cost of getting them. Eighteen months after the study was begun, the company had reduced its manpower in these overhead areas from 700 to 450—a reduction of over 35 per cent. This saving alone contributed almost $1,250,000 to profits before taxes—more than had been earned in any one of the preceding three years. Today, the company's volume has risen from $17 to $26 million, but it is still operating with an overhead complement of fewer than 500 persons.

Another company—this one in the chemical industry—was confronted two years ago with the necessity for adding substantially to its office space. The company had been growing continuously over the preceding several years, and the acquisition of more space for its administrative personnel seemed a normal and inevitable part of the total growth pattern. But when the board of directors was asked to approve a capital expenditure of roughly $1 million for a new wing to the office building, it asked that a careful study be made before the appropriation request was acted upon "to determine if existing facilities and personnel are being employed to the best advantage." One of several projects that grew out of this request was an intensive review of the company's order-filling activities, including the paperwork aspects (sales-order processing, invoicing, accounts receivable and finished-goods inventory record keeping) as well as physical handling (warehousing, stock picking, and shipping). As a result of the study, the company was able, over a year's time, to reduce the personnel engaged in these activities from 275 to 145, or almost 50 per cent.

4. *Savings in the clerical field are not limited to reduction of the*

work force. Procedures studies can also produce substantial—though perhaps not spectacular—savings by eliminating the chronic need for overtime work, by reducing equipment or space requirements or by increasing their utilization, by cutting supplies expense, and by making possible the use of lower grades of labor.

An interesting example of how diversified the potential savings are can be found in the experience of a large wholesale firm. Invoices of this company were mailed to customers a week to ten days after shipment had been made. The principal reason for the delay was the fact that the billing department was usually that far behind in its work. A complete overhaul of the order-processing procedures and billing methods enabled the department to get rid of its backlog and keep current in its work. One of the results was a reduction of almost $500,000 in the company's working-capital requirements.

5. *Clerical cost savings are a direct contribution to company profits.* Too often management men take a passive attitude toward reduction of paper-work costs because they unconsciously tend to measure savings against gross sales instead of net profit. A $5,000 reduction in office expense causes little excitement when compared with $20 million annual sales. But what is generally lost sight of is that this saving represents a 100 per cent contribution to profits, whereas only a very small part of each sales dollar ever reaches the profit point. In a company that earns 5 per cent on its sales dollar, the elimination of just one $4,000-a-year clerical position contributes as much to net profits as sales orders totaling $80,000. But—and this, too, is often overlooked—the $80,000 worth of merchandise must be resold each year, whereas the saving in operating expense automatically repeats itself year after year.

6. *The economics of overhead expense produce a compelling incentive to dig for these savings.* In most companies, administrative expenses are many times greater than net profits. Because these expenses consist mostly of salaries, they are relatively insensitive to fluctuations in business volume. For this reason they constitute a continuous and serious threat to profits. Even in the face of a moderate decline in sales, their inflexibility can increase unit costs to a point where profits are wiped out. Certainly much of the responsibility for this jeopardy to profits must be borne by clerical costs, since they constitute a major part of the administrative element.

Thus necessity is added to opportunity. A positive approach to

profit protection requires the reduction and control of clerical costs that can be achieved through continuing procedures analyses.

In recent years, these "facts of business life" have attracted an increasing amount of top-management attention. In his company's annual report to stockholders, the chairman of one large corporation stated, "The Company's earnings improved in 1958 despite a dip in sales volume. . . . The increase over 1957 reflects our Company-wide program to reduce general, administrative, and distribution expenses."

In still another company, the president—in inaugurating a profit-improvement program—stated, "A reduction of 10 per cent in our data processing and related costs (a goal that is certainly not unrealistic) would be equivalent to the total annual dividend paid in recent years to our stockholders."

7. *The very steps that cut clerical costs will also produce a better clerical product.* If a company reduces its advertising appropriation or sales promotional expense, it normally expects a lower volume of sales. To be sure, the planned reduction in expense may be justified on the ground that it will have a relatively small effect on volume. But some decline in sales performance is usually anticipated.

Quite the reverse is true of clerical expense. By reducing the cost of getting the clerical job done, we are very likely to realize *improved clerical performance.* The work-simplification measures which produce clerical savings also eliminate the most prolific source of clerical error—complexity. Further inroads are made in the volume of error by provision of adequate checking points in the streamlined procedure.

But improvement in performance is not limited to higher quality of work. As needless operations and backtracking are cut out, as work scheduling improves, backlogs vanish, and the whole procedural cycle is accelerated.

These two factors—greater accuracy and faster execution—play a leading role in achievement of the other benefits to be considered.

Reduction of direct costs. However promising the opportunities to reduce clerical costs, the benefits of procedures research are no more confined to this achievement than procedures themselves are confined to the office. Even greater savings can be made in the factory.

Manufacturing cost reduction is normally considered the province of the methods men, tool designers, and industrial engineers. But

their work is concerned with the physical aspects of handling and processing product materials—with reducing and simplifying worker motions; with developing faster, more automatic, or larger-capacity machines; with selecting better tools; with substituting materials that require less processing time.

It must be remembered, however, that the *availability* of materials and tools at the right time, in the right quantities, and at the right place, is governed by paper work. Thus, in large measure, the effectiveness with which men and machines are utilized is determined by the adequacy, accuracy, and usefulness of production and material control records and of the forms supporting them.

Here are some of the ways in which development of better records and paper work can contribute to reduction of direct costs:

1. By eliminating idle man and machine time that results from poor scheduling or unavailability of materials.
2. By reducing the need for overtime work by productive labor.
3. By minimizing investment in inventories and losses from obsolescence or shrinkage.
4. By achieving tighter control over scrap and rework costs.

The experiences of the following companies testify to the size of the direct-cost penalty that lack of control imposes.

1. The production plans of a heavy equipment manufacturer were based on contract commitments calling for completion and shipment of 65 units each month. Adherence to this schedule required full utilization of the available labor supply on a fully manned first shift and a partially manned second shift.

The manufacturer had trouble fulfilling his contracts because shortages of detail parts frequently interrupted assembly operations, particularly during the first half of each month. In some instances, inventory records showed that required parts were available when none were actually in stock. In other instances, the supply of certain parts simply did not keep up with assembly demand.

Investigation revealed that the fundamental cause of this condition was lack of accurate and adequate control information of four types:

a. Lists of parts shortages caused by work spoilage, rejections on incoming shipments, and design changes. Without this information, parts replacement was haphazard and incomplete.

b. Records covering the status of casting orders issued to the

foundry and showing quantities ordered, in process, and delivered to stock.

c. Records covering flow of work and performance in the machining department.

d. Stock records of detail parts. The discrepancy between stock records and physical inventories was brought about by defects in the procedure for issuing parts from stock.

In spite of these handicaps, the company came close to meeting its commitments, but only at the penalty of a 25 per cent increase in its production costs. The reasons for this cost increment are evident in Fig. 1.

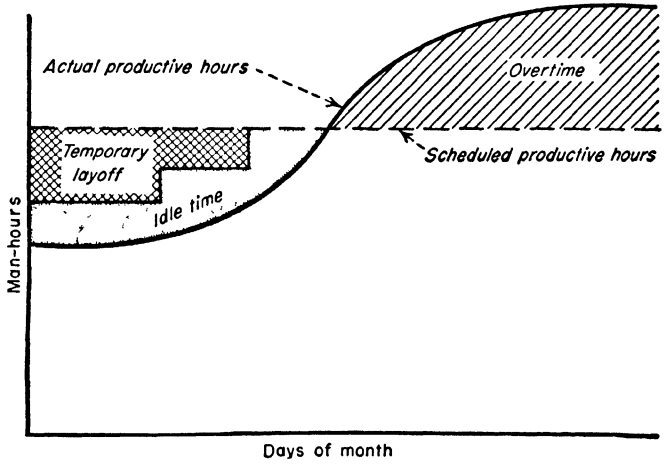


Fig. 1. Effect of Unavailability of Materials on Direct Labor Costs

During the first half of each month there was considerable idle time in the assembly department because of the depletion of parts stock. Workers were required to move back and forth from one assembly job to another. Machines almost completed stood for days awaiting one or two missing parts. In the latter part of each month, all orderly processes of manufacturing control were abandoned under the pressure to make up lost time. Both the machining and assembly departments operated on a heavy overtime schedule. Parts were "borrowed" from machining lots to keep assembly operations going. Foremen, shop clerks, and production control personnel dropped their normal functions to expedite parts.

The impact of this month-end scramble on the following month's production is obvious. The cycle simply repeated itself: stock depletion, idle time, and hand-to-mouth assembly, followed by overtime, high expediting costs, and exhaustion.

2. A company engaged in the development and manufacture of missile systems had a substantial number of military equipment contracts. This company made several types of equipment, it had more than one contract on each, and it subcontracted substantial parts of the work.

As technological advances were made in its rapidly changing field, the company experienced periodic cancellations of some of its contracts. Cancellation notices required that the company not only stop its own work on the contracts affected but also promptly notify subcontractors to stop their work on specific parts and subassemblies. Failure to act promptly involved a serious financial risk, for there was every likelihood that the company would not be able to recover in its claim the cost of work done more than a few days after receipt of cancellation notice. Yet the company's material control and contract-status records were so inadequate and poorly maintained that an average of three weeks was required to identify the subcontract parts affected, to determine the quantities to be canceled, and to issue instructions to suppliers.

Not all opportunities to cut direct costs through development of better control records are so spectacular as these, but there are few businesses where some opportunities do not exist. One company, for example, found that it was losing discounts on purchased materials because its receiving, incoming-inspection, and invoice-verification procedures had become so time consuming. Another discovered that its outstanding purchase commitments were $200,000 in excess of requirements because of a faulty procedure for converting its sales forecast and production plans into a material requirements schedule. A third company found that tighter production control reduced its manufacturing cycle to a point where in-process inventories were cut by 20 per cent.

Improvement in customer service. So far we have concentrated on how procedures research pays off by *cutting the cost of getting end results.* But what of the dividend it can earn by *improving end results themselves?*

All businesses exist to ship merchandise or render service to customers. The speed with which this is done is one of the important counters in the play-for-keeps game of competition. The more stand-

ardized the industry's product line and price structure, the larger this counter becomes.

How fast and how effectively an entire organization functions in serving its customers depend on the speed and quality of its paper work. Streamlined procedures, improved methods, and tighter controls accelerate both the clerical and manufacturing cycles. They cut the time required to edit sales orders, to check credit, to transmit order-filling instructions to all points of action. They speed up the material procurement process. They protect against lost time in factory operations. They facilitate traffic clearance of shipments.

Conversely, complexity and antiquated methods produce errors and delay. In businesses where the function of procedures as a *means* of getting things done is lost sight of, paper work often becomes so cumbersome and time consuming that it seems as if a resolute effort were being made to obstruct progress rather than to promote it.

But the contribution of procedures research to better customer service is not limited to speeding up shipments. Better records will make possible faster, more realistic replies to customer inquiries on the status of their orders. Simple procedures and improved clerical methods will reduce packaging and billing errors and ensure accurate identification of items shipped. If a company sells a number of different items to each customer, tighter material and production controls will keep output geared to composite customer demand. Thus, sales orders can be filled in a few large shipments instead of many small ones. From the customer's point of view each shipment, in turn, will contain a better balance of merchandise.

Increasing the effectiveness of executives, salesmen, and technical personnel. A well-planned system of standard procedures increases executive effectiveness in two ways:

1. *It conserves management time.* This is true of all echelons of management, from top executive to group supervisor.

For example, soundly conceived control procedures, covering matters that require top-management approval, permit delegation of authority to subordinates. Thus, bottlenecks are eliminated and action facilitated, while adequate control is retained by the delegant to ensure that performance is satisfactory. As Holden, Fish, and Smith point out: [1]

[1] Paul E. Holden, Lounsbury S. Fish, and Hubert L. Smith, *Top Management Organization and Control*, Stanford University Press, Stanford University, Calif., 1941, p. 78. (Reprinted with the permission of the authors and of the publishers.)

Each time a well-planned control procedure is substituted for personal approvals, additional time is made available to the top executives for the far more important over-all planning and control of the enterprise, which is aimed at securing maximum effectiveness of the company as a whole, rather than control of any individual problem.

The same is true for departmental executives and supervisors. As patterns are established for carrying on repetitive tasks, the need for close personal direction of worker effort is reduced. The simpler the pattern, the more effective the operating executive becomes.

2. *Fast procedures make possible prompt executive decision and action.* However well designed the structure of executive reports, its usefulness to management will depend upon the age of the information it presents. Without fast procedures for gathering and correlating data, management control information cannot be fresh. Without fresh figures, decisions and action cannot be timely. Without timely action, management cannot be fully effective.

In addition to these values to the executive group, simplified procedures can also increase the productivity of other key groups, such as field salesmen, engineers, and research personnel. As an example, one company added the equivalent of 20 full-time men to its sales force by a reduction in the amount of paper work required of its salesmen.

Improvement in employee morale. Among the basic ingredients of sustained employee morale are understanding, interest, pride of accomplishment, and confidence in leadership. There are few workers whose interest and loyalty can long be maintained if they do not feel that their work is necessary and fruitful—that they are making a perceptible and worthwhile contribution to the affairs of the business. Moreover, they want to perform their work in an atmosphere of calm efficiency. Although occasional rush jobs may help to develop team spirit, continuously hectic operation and recurring crises quickly induce lunchroom speculation about "whether the boss knows what he's doing." There just cannot be much job enthusiasm or confidence among an embattled force of clerks struggling with red tape, antiquated methods, or complexity which defies comprehension.

Yet too many companies seem to rely on other forces to sustain employee interest—on the romance of the industry, on dynamic growth, on size or publicity or leadership in the public mind. Though these factors are unquestionably attractive to the new employee, their influence soon diminishes as he associates himself more with his own

job and its immediate environment than he does with the company as a whole.

Here, then, is one of the most significant, intangible benefits of an organized procedures improvement program. By developing simple, effective, purposeful clerical routines, it eliminates confusion and promotes understanding. It ensures that all work performed is necessary and useful. It removes backlog pressures, error hazards, and frequent overtime work. It cuts out the constant interruption of normal routine by special expediters trying to pry something loose or find something lost. It substitutes orderliness and dispatch for disorder and delay. It fosters tidy thinking and work habits. It facilitates clerical job classification and, therefore, makes possible a more equitable compensation plan.

Nor is its effect on employee morale confined to clerical workers. In a large manufacturing company having three plants within a 15-mile radius, employee transfers within each plant and between plants were frequent. Weekly pay envelopes of factory workers were delivered by pay wagons to each department and distributed to the workers. The procedure for transferring payroll and personnel records, however, was incredibly slow, with the result that a transferred employee was seldom paid in the normal manner until he had been at his new location for several weeks. If the pay wagon contained no envelope for him, the worker had to get his foreman's permission to leave the department, go to the cashier's cage, prove that he had not been paid, and receive an advance against his wages from petty cash funds.

The cumulative impact of this condition on morale throughout the factory is obvious. Workers mentally refuse to ally themselves with a management for which they have no respect. And the measure of their respect depends upon the small daily occurrences which affect them directly and personally.

Compensating for labor shortages. At the time this is being written, economists are predicting an increased tightening of the clerical labor market for several years to come. In addition, more pronounced local shortages are already being experienced by some companies. One large military equipment manufacturer grew so rapidly that in a relatively short time it became the largest employer in its geographic area. As a result, the supply of available clerical labor became almost wholly exhausted in a number of the communities in which the company's plants are located.

Progressive managements are not content to regard such circumstances as an excuse for high clerical costs or low productivity. Instead, they consider it all the more imperative that procedures be streamlined to reduce personnel requirements in numbers as well as in the level of skill and experience necessary to the job.

More effective policy execution. The first chapter mentioned that procedures are one of the means by which policies are implemented. How effectively they are administered will be determined, to a large extent, by the thought and skill applied to developing mechanics for their execution. Credit policies cannot be carried out satisfactorily unless records are adequate to the job. The seniority clause in a union contract will be a fertile source of grievance unless the procedures for handling layoffs and transfers are carefully tied in. A specialty store's policy of always offering a wide selection of style merchandise cannot be achieved without serious inventory risk unless the clerical organization is geared to furnish buyers with up-to-the-minute sales statistics by item, style, color, and size.

Development of teamwork among departments. The specialization of function, which has been the natural consequence of growth in business size, has tremendously increased the burden of coordination. Urwick attempts a measure of this burden when he states: [1] "It seems incontestable that the most urgent need in modern . . . business is a rapid evolution of new machinery and methods designed to improve coordination." Despite departmentalization, the interaction and interdependence of the organization units comprising a business require that there be unity of the whole if the company's objectives are to be achieved promptly and economically—or, indeed, if they are to be achieved at all.

It is not enough to rely on an organization manual to supply the mechanics or framework of coordination. Organization definitions of responsibility delineate the boundaries of departmental function. Procedures, on the other hand, tie departments together in an active, living relationship. They specify how departments serve or are served by each other in performance of the recurring work of the enterprise. Complete, soundly developed procedures will do much to minimize the uncertainty and the areas of controversy which lead to "buck passing" on the one hand and to conflict, ill will, and ungainful competition on the other.

Aside from the contribution that established procedures make to

[1] L. Urwick, *The Elements of Administration,* Harper & Brothers, New York, 1944, p. 74.

the development of teamwork, the very process of formulating or of studying and improving procedures accomplishes a similar purpose. Through interchange of ideas and information, executives become more familiar with each other's activities and acquire a more sympathetic comprehension of each other's problems.

Facilitating change. The final way in which procedures research pays off is by keeping the organization in step with changing conditions—by making possible orderly retrenchment or expansion, by hastening the assimilation of new activities.

Confronted with a substantial decline in sales volume, the general manager of a manufacturing company set a 25 per cent reduction in overhead expense as the objective to be met by his operating executives. Later, the company's industrial relations director, in explaining how he made the reduction in his area of responsibility, said, "I started with a list of all the activities which the 200 people in our department perform. Activities were arranged on the list according to my estimate of their relative importance, and opposite each appeared the number of persons it engaged. I then worked up from the bottom of the list, eliminating each activity until I had accounted for 25 per cent of our current expense."

Military tacticians would hardly consider this a skillful retreat —and justly so—for cutting people from the payroll by eliminating services requires little, if any, skill. Yet frequently this arbitrary technique is resorted to in the face of business contraction. At worst, it may mean that abandonment of essential services costs the company more than the resulting payroll saving. At best, it means that the remaining functions perpetuate their inefficiencies and that no effort is made to determine the effect of restricted volume on their performance.

Other types of change make the need for a thoroughgoing reappraisal of procedures even more evident. Companies expand, enter new markets or industries, diversify their products, build new plants, decentralize their operations. Major changes are made in organization structure. Departments performing related functions are combined. Mergers take place. New companies are acquired. New legislation promotes new clerical activities. Too often these changes provide an excuse rather than a reason for complexity, duplication, or breakdown of procedures. Only a conscious effort to adapt procedures and controls to new requirements will keep them from becoming a serious impediment to change.

Summary. To supplement the statement of Alfred P. Sloan appear-

ing at the beginning of this chapter, we might regard the technical research carried on by many modern businesses as a type of insurance policy—insurance against product obsolescence—and the cost of doing that work as the premium paid on the policy. Similarly, organized research work in operating procedures is a kind of insurance policy that can be written against other competitive factors which loom large on the horizon—the competitive factors of overhead expense, manufacturing cost, and customer service.

Few companies can afford *not* to carry this type of insurance, for there is probably not a single procedure in any business anywhere that cannot be performed more simply, more effectively, and more economically. The savings and improvements realized must, of course, pay for the effort expended in securing them. But American business is still far from reaching that point of diminishing returns. The pay dirt for profit building through procedures improvement is a long way from being exhausted.

Part Two

THE INGREDIENTS OF A SUCCESSFUL PROCEDURES IMPROVEMENT PROGRAM

Chapter 3

BARRIERS TO PROCEDURES IMPROVEMENT

The first ingredient of a dynamic, profit-oriented procedures improvement program is clear-cut recognition of the reasons so many such programs fail. The word "fail" is not used here to imply that a large number of formal systems and procedures programs die out or are abandoned. In fact—once inaugurated—most staff programs of this sort seem to be carried along almost indefinitely. But, despite this fact, the accomplishment record and the operating climate of these staff groups all too often provoke questions such as these: Why are so many systems and procedures staffs bogged down in the minutiae of forms control, procedures patchwork, or office-equipment standardization—without ever producing significant measurable savings or helping to improve the management process in their companies? Why do so many conscientious but frustrated systems and procedures men complain chronically about lack of top-management support and operating-management cooperation? What are the real barriers to achieving all the potential benefits of procedures research that were cited in the preceding chapter? Why are these improvement opportunities still awaiting their fullest exploitation in most companies?

The beginning point in developing realistic answers to these questions lies in recognizing that the need, in this instance, is not merely one of overcoming normal resistance to change. Actually, the problem is much more subtle and complex than that. Specifically, a number of basic conditions and attitudes peculiar to the office area make systems and procedures improvement work a good bit more difficult than staff work in the factories. These critical conditions and attitudes are:

1. Lack of top-management understanding.
2. The illusion that administrative costs are controlled through budgets.

3. The hidden character of procedures improvement opportunities.
4. Lack of hard-headed profit consciousness among most of the managers of functional segments of a business.
5. Lack of acceptance of the procedures staff by line managers and supervisors.
6. The desire for protection among supervisors of paper-work activities.
7. Failure to tackle procedures improvement projects in a broad-gauged, fundamental way.

Lack of top-management understanding. Top executives seldom fully appreciate (1) the role of formal procedures in business management, (2) the obstacles that stand in the way of procedures improvement, and (3) the price that must be paid to make the improvement program succeed.

This lack of appreciation is certainly understandable, for the line of progression to top management is generally through key positions in the sales, production, or financial branches. It is rarely, if ever, through the channel of paper work or clerical supervision. Another factor conditioning top-management attitudes is that the most dynamic growth in American business history has traditionally come through entrepreneurial moves and shrewd intuitive decision making. As a result, the contribution that better administrative management can make to the success of the enterprise has not yet fully insinuated its importance into top-management consciousness.

But, whatever the cause, the result is that, in most instances, top management has not done the things that it must do—and that *only* top management can do—to ensure the success of the systems and procedures program.

The illusion that administrative costs are controlled through budgets. The income, cost, and expense goals making up a budget are aimed at achieving a predetermined profit objective, but not necessarily the maximum profit, either over the short or long run. This is because, outside the production area, the level of expenditures provided for in a budget is essentially an arbitrary rather than a "scientifically" determined amount. For most activities, the budget usually amounts to little more than a reflection of past performance, eloquently defended. It is arrived at by a process of negotiation in which the most articulate participant is motivated by personal incentive and a host of purely departmental considerations instead of by maximum contribution to

company profits. In other words, expense budgets are usually subjectively determined by the very persons for whom they serve as standards of measurement.

In any event, the illusion that paper-work costs are effectively controlled by the budgetary process is one of the obstacles that keeps managements from taking more fundamental steps to achieve this control.

The hidden character of procedures improvement opportunities. Much of the waste and inefficiency in business procedures is hidden. It is seldom as perceptible or dramatic as the scrap pile or shutdown machine. Neither casual observation nor traditional accounting information makes it evident.

As a result, there is widespread failure—at all levels of management—to appreciate how much pay dirt lies in this area. Most managements would be shocked at the suggestion that reductions of 25 to 30 or even 40 per cent could be achieved in paper-work activities. Hence, businesses have generally been content to achieve marginal gains in these areas and to leave things very much as they are, as long as they seem to be operating smoothly. Yet, the author has seen the cost of operating purchasing departments range from $4 to $22 per purchase order issued; the cost of the payroll function range from $.50 to $3.25 per payroll check prepared; and the cost of a single-item billing and collection operation vary from $.70 to $2.85 per collection. In all these cases, the high-cost companies have no way of knowing that they are high cost. The plain fact is that there are no cost standards for comparison and very little other knowledge throughout American business as to how many people are actually needed to run an office activity. And without having some sort of revealing cost comparison, management is in the dark on two counts: first, its members have no reliable yardstick of worker productivity; second, they seldom realize how many of the activities being performed in these paper-work areas can safely be eliminated.

Lack of profit consciousness. A direct outgrowth of the condition discussed immediately above is that front-line clerical supervisors do not often have a highly developed sense of profit consciousness. This does not necessarily mean that they are poor managers. A given clerical supervisor may be doing a conscientious, highly competent job. At the same time, he tends—as we all do—to concentrate on those parts of his job on which he is most frequently checked or judged. And because there are so few cost standards for measuring

efficiency in areas of paper-work activity, the people who supervise them are most frequently judged by the quality and speed of the service they render. It is not uncommon, therefore, to find overstaffing of a department to handle rush jobs or work peaks as promptly as possible without interrupting the regular routine. The supervisor usually cannot control these peaks and special demands, so that his natural inclination is to be prepared for every contingency. Thus, consciously or unconsciously, he will often resist any effort that might impair his flexibility for rendering this kind of service.

In addition, supervisors of such activities typically do not have a very highly developed sense of value-cost relationship. The more conscientious they are, the more they tend to be perfectionists and to regard as fundamental the activities that happen to be their own peculiar daily concern. As a result, they are usually shocked at the suggestion that what they are doing may not need to be quite as thorough and precise as they have tried to make it.

But, this lack of profit consciousness is not limited, by any means, to down-the-line supervisors or managers. It is just as likely to exist among higher-level executives heading up major functions of the business.

An example can be found in the experience of a company that some time ago launched a five-year "administrative improvement program" aimed at both cutting costs and strengthening procedures in virtually all of the company's major systems areas. Recently the head of the company's administrative engineering staff met with his superior, the company president, to review the progress that had been made on the program. Although the two men agreed that some real accomplishment had been made, they both felt that on the whole they were a good bit behind schedule and that some parts of the program were dragging badly. In trying to analyze the reasons for the generally unsatisfactory progress, the two turned their attentions to the sort of support that had been given to the whole program by key people in the organization.

In this connection, the staff head said to the president, "As I see it, there are 16 executives in our company on whom the success of this program depends. They are the seven operating executives reporting directly to you and the nine major executives at the next lower level who report to some of the first seven. Now, in order to get a true picture of how much support our program is getting, let's try to rate each of these 16 men in two different ways—first, according to how

interested he is in making improvements, and next, how interested he is in cashing in on them. That is, first, how much attention has he given to straightening out his plan of organization, streamlining his procedures, eliminating work, and adopting better methods and equipment? Then, how interested is he in *cashing in on* these improvements —that is, in converting statistical savings into realized savings?"

The two men agreed that within each of the two categories they would rate each man as being either strongly interested, moderately interested, or very little interested. As a result of this process they found that, in all honesty, they could rate only two of the 16 executives as being strongly interested both in making improvements and in cashing in on them.

In the face of this realization, the president said: "I guess this means that I haven't done my part of the job. The real job I've got to do now is to see that the other 14 get the same sort of 'religion' that the top two have got."

Lack of staff acceptance. Still another obstacle is the fact that procedures improvement staffs are not so readily accepted among managers of office activities as staff units are in the factory. In industrial companies, staff specialization in the manufacturing area has become traditional and well accepted. Over the years it has gradually relieved foremen of the responsibility for planning facilities, developing production processes, and even, in many cases, determining the manpower complement. These are the activities that have been taken over by such specialists as the process engineer, the methods engineer, and the industrial engineer. No such development, however, has taken place in the office; hence the office executive or supervisor still considers himself primarily responsible for developing his own objectives, goals, methods, and procedures—for deciding what will be done, how it will be done, and how many people he needs to do it. Thus, he views any attempt to change these elements as an intrusion on his own domain, or, at least, as something of a reflection on his own managerial record.

The desire for protection. Closely related to lack of profit consciousness is the desire for protection that inflates clerical costs by building up excessive controls and increasing the work force. Once an organization unit has been accused of delaying an activity, making a mistake, or losing a document, it has a compelling incentive to create records that will either protect against repetition of the error or prove the group's innocence in the future. It is an unusual organization that does

not have a host of registers, time stamps, double checks, extra copies, follow-up records, and additional reports exclusively for this reason. Yet the cost of these controls is often many times greater than the errors they protect against. Their value for fixing blame is, of course, even more questionable.

A second form of desire for protection might be labeled "the protection of numbers." In our competitive economy, the number of one's subordinates has somehow become a symbol of importance among managerial personnel—particularly among front-line and middle-management supervisors. The supervisor's set of values is often pervaded by the belief that the size of his unit is a measure of his responsibility in the eyes of both his associates and his superiors. He may feel that this factor has an effect upon his compensation and upon the consideration he is given when important vacancies occur. Where this belief persists, it discourages voluntary efforts to develop procedures improvements that will bring about any sizable reduction in the work force.

Lack of a fundamental approach. The barriers already discussed have one element in common: they all reflect attitudes or conditions that exist among operating management. In contrast, the seventh and final obstacle is created by the systems and procedures staff itself. It grows out of the common failure of such staffs to approach the procedures improvement program in a broad-gauged, fundamental way.

The plain truth of the matter is that a great many so-called "systems and procedures" men are merely technical specialists rather than administrative analysts and problem solvers. As a result they tend, in their work, to apply suboptimizing approaches which, all too often, result in perfecting only a small piece of the total systems and procedures structure—even to the point of harming the structure as a whole.

One controller tells the story of a procedures man on his staff whom his coworkers nicknamed "50-bank Adding Machine." "No matter what area of the company he worked in, he always ended up by putting the mechanics of doing the work on a multiple-bank adding machine. Try as you might, you could not get that man to think in any other direction." [1]

Not all forms of suboptimizing among procedures men are as

[1] Norman A. Coan, "Systems Man: Technician or Architect of Management?" *Systems and Procedures Quarterly,* May, 1956.

extreme as this example. Yet in one form or another, the problem persists. The great majority of systems and procedures staffs fail to win confidence and produce enduring results because of their preoccupation with some one of the following narrow, specialized approaches:

1. The fire-fighting or trouble-shooting approach.
2. The accounting-systems approach.
3. The manual-writing approach.
4. The forms-control approach.
5. The mechanization approach.

The Fire-fighting Approach. Under this approach, the staff is concerned with solving paper-work problems as they arise, usually in the form of requests from operating personnel. While this sort of approach has the lure of being service-oriented, it usually amounts to little more than an expedient patching up of weak spots in the routines of the business. It keeps procedures staff members "so busy handling the urgent, that they have no time for the important." With their attention absorbed in providing someone with an extra copy of the receiving report, in evaluating the counterclaims made for manual and electric typewriters, or in straightening out work-scheduling practices in the stenographic pool, the staff never finds the time or develops the ability to tackle the key systems problems of the business.

The Accounting-systems Approach. As the caption implies, the whole focus in this approach is on perfecting the accounting system, with particular emphasis on seeing that tight protective control exists over all transactions affecting company assets.

One newly formed procedures staff undertook as its first project the development of better methods for maintaining the company's fixed-asset records. Two man-years of effort were spent in studying different asset–record-keeping practices among the company's several divisions, in developing and obtaining agreement on recommended changes, and in directing the change-over to the new system.

As a result of this project, the company converted its fixed-asset records to a punched-card system that has the advantages of (1) being uniform among all divisions, (2) being continuously more up to date, and (3) providing the means for extracting summary information from the records more quickly than was possible under the former system.

Over a period of time, however, these features have turned out to

be more in the nature of niceties than true benefits. The reason is that the new system has produced no saving in clerical costs, no better information for reaching capital-appropriation decisions, no greater protection against loss of assets, or no greater accuracy in calculation of the company's over-all depreciation expense.

The Manual-writing Approach. In still other instances, companies that have launched formal procedures programs have made the mistake of assuming that the job consists of developing and maintaining standard practice instructions manuals. But, manual preparation is *not* systems and procedures research. It is only the recording and communication phase. It makes no provision for the primary creative functions of investigation, analysis, and design.

The Forms-controls Approach. Proponents of this field of specialization claim that since forms are the raw materials of office production, "forms control is the key to administrative cost control." But, although a sensible degree of control over forms should be included in every well-balanced procedures program, forms control by itself is an extremely limited, in-the-back-door effort to solve the broad problem of administrative costs and effectiveness by hacking away at one of its minor segments. In a very real sense, the claim of these proponents is very much like saying that the key to making profits in the automobile industry lies in developing tighter control over raw-material specifications and inventories.

An example that will help to keep both the forms-control and manual-writing approaches in perspective can be found in the experience of one of the nation's largest industrial companies. One of the principal operating departments of this company employed over 2,500 clerks in its office operations scattered across the country. With paper-work volume of this magnitude, the department had set up its own so-called "methods and procedures staff" in the late 1940s. In subsequent years this staff implemented a highly developed manual-writing and forms-control program. All recurring procedures of the department—both at headquarters and field branches—were reduced to detailed standard practice instructions. The resulting set of three loose-leaf manuals was distributed to every manager and supervisor of the department. In addition, form-numbering and functional classification schemes were adopted for all printed and duplicated forms. Overlapping forms were combined. Physical specifications were established on the size and grade of paper, form layout, and the like. Printing standards were established, the most economic ordering

quantities were prescribed, and the rule was laid down that no new form could be ordered without approval of the departmental methods and procedures staff.

Almost ten years after this departmental staff had been created, members of another staff—the corporate organization and procedures group—were brought in to tackle the problem of spiraling clerical costs in the department. By applying a meaningful and imaginative approach to the problem, this staff was able to develop changes that cut the department's clerical costs by $3.5 million a year and, at the same time, substantially improved the usefulness of the department's management reports as tools for decision making and control.

The basic reason these gains took ten years to achieve is that the department's own staff had let itself become preoccupied with the trappings of systems and procedures instead of with the fundamentals.

The Mechanization Approach. Of all forms of suboptimization that characterize procedures improvement work, the mechanization approach is clearly the most pernicious and pervasive. It has its roots in two illusions that unfortunately are all too common throughout American business. The first is that the improvement of office operations by and large means mechanization of the office. The second is that if a given operation can be done on machines, that must per se be the best way of doing it. Or, if a given operation can be performed on complex, highly automatic equipment, that must per se be better than doing it on simpler general-purpose, hand-operated equipment. Yet some of the highest-cost clerical operations exist in companies that are using the most modern, high-speed office equipment in most of their operations. This does not mean, of course, that the costs in these offices are high because of mechanization. It simply means that the managements of these offices have fallen into the trap of assuming that mechanization means efficiency and by this process have overlooked the other more fundamental ways to reduce paper-work costs.

The mechanization approach to systems and procedures work has become particularly widespread with the advent of electronic data-processing equipment. In most companies, investigation of the possible application of electronic computers is carried out by members of the systems and procedures staff. Typically, such studies draw considerable attention; they require intensive effort over a long period of time; and they give participants an opportunity to "get in on the ground floor" of a dynamic new field. As a result, more than a few such staff specialists have become captives of the new technology.

With eyes bright but out of focus, they lose their ability to be objective and tough minded about the savings or other benefits that EDPM will really produce. Their clear conviction becomes "Electronics eventually—why not now?" And by this process, they become perverted from systems and procedures men to *machine* men. They no longer have an impartial, professional concern for improving administrative processes—by any or all means that can be profitably employed—but a partial concern for justifying or finding new applications for a particular piece of hardware.

Some companies even seem to foster this sort of prejudicial thinking from the beginning. As examples, to spearhead their so-called "electronics feasibility studies," two large companies appointed respectively a manager of electronic applications and a director of electronic program. This is much like hiring a licensed aircraft pilot and asking him, as his first assignment, to study and submit recommendations on whether the company should buy its own executive airplane.

The danger implicit in letting this suboptimizing approach dominate the thinking of systems and procedures staff is underscored by the following experience. Four years ago, a company with a clerical force of 3,200, undertook what it labeled a basic long-term study aimed at bringing its control of office costs up to the level of its control over factory costs. But the task force that was charged with this mission limited its efforts to evaluating the feasibility of, and ultimately directing the installation of, a large-scale electronic computer. This installation replaced 140 of the company's 3,200 employees, with a consequent payroll saving somewhat in excess of the cost of the computer operation. By the application of this cost vs. saving criterion, the venture was considered successful. Yet the company's clerical cost-control problem was still far from fully solved because less than 5 per cent of its clerks were covered by the study. Moreover, one wonders how much greater savings might have been achieved by applying to all 3,200 clerical positions an amount of imaginative work-simplification effort equivalent to the 36 man-years of analytical talent expended on the electronics study.

The true role of mechanization in the procedures improvement program can best be summarized by thinking in terms of *all* the steps that make up a dynamic approach to (1) cutting administrative costs and (2) strengthening management information. These two end-result objectives are selected because they represent the areas of

justification on which recommendations for increased office mechanization are most frequently based.

The ingredients in a fundamental approach to cutting administrative cost are to:

1. Motivate line managers to *want* to cut their costs.
2. Reevaluate what work *must* be done or "earns a profit."
3. Modify the indirect factors, such as policies and organization structure, that affect the volume or complexity of clerical work.
4. Select the best method—manual, mechanical, electric, or electronic—of performing the essential work.
5. Apply objective measurement techniques for determining how many people are really needed to do the required work by the method selected.

As will be spelled out more fully in Chapter 11, the key steps in a fundamental approach to improving management information are:

1. Identify the critical aspects of the business, that is, the end results and other elements of performance, that need to be planned and controlled.
2. Determine what specific information is needed for decision making and control with respect to each of these factors.
3. Motivate and train line managers to use the new information tools.
4. Determine the best method of preparing the required information within essential time limits.

The point to be stressed in examining these two lists is that although methods selection is admittedly an essential step in each formula, it is the last or nearly the last step to be taken and, in the author's experience, is often the least important of the steps in terms of its contribution to the end result. In any event, there can be no doubt whatever but that mechanization by itself can never eliminate the need for, or excuse managements from, taking the other steps in each formula. In the area of administrative costs, unless the other four listed steps are taken, no amount of office automation will produce real efficiency. Similarly, in the area of decision making and control, increasing a company's information-generating capacity is no substitute for fresh, disciplined thinking about what information is clearly needed or can be profitably used in managing the business.

Chapter 4

ORGANIZING FOR PROCEDURES IMPROVEMENT

The orderly and successful performance of any major human undertaking, of whatever character, requires that a definite sequence of steps be followed in its planning and execution. These steps are:

1. Clearly defining the objectives and scope of the undertaking.
2. Developing policies necessary to achieve the objective.
3. Fixing responsibility, that is, building a logical, workable organization to do the job.
4. Working out a comprehensive approach and plan of action.
5. Applying skilled techniques to the work undertaken.
6. Maintaining control through some positive means for measuring results achieved.

If a program of systems and procedures research is to be purposeful and fruitful, it must be evolved according to this conceptual scheme. There is no other quicker or easier path. The field of paper work is littered with the wreckage of systems and procedures programs which have broken down altogether or are producing only fragmentary results. Almost without exception these failures have occurred because, in the conception or development of the program, one or more of these steps were wholly ignored or given only perfunctory attention.

The first three steps of this formula will be considered here, the remainder in the three succeeding chapters.

DEFINING OBJECTIVES

The objectives to be achieved have already been defined—at least by implication. They may be restated here as *the development and*

maintenance of simple, effective, and economical procedures for the purposes of:

1. Cutting clerical costs.
2. Reducing direct costs by building tighter operating controls.
3. Improving customer service.
4. Increasing the effectiveness of executive, sales, and technical personnel.
5. Raising employee morale.
6. Compensating for shortages of clerical labor.
7. Improving policy execution.
8. Developing teamwork among departments.
9. Facilitating change.

Mere definition, however, is not enough. To be meaningful, the objectives must be made known to the entire organization and must be rooted in management conviction that their achievement is both necessary and possible.

ESTABLISHING POLICIES

To be fully effective, the procedures program must be based on the following two top-management policies:

1. Procedures development and improvement work must be positive and continuous—not passive, intermittent, or expedient. In its passive form it is confined to:

   a. Development of new procedures whenever required to implement new policies, carry out new activities, or conform to new legislation.
   b. Revision of existing procedures as operating experience reveals the need for change—which is a somewhat euphemistic way of saying "putting out operating fires."

But in its positive form procedures research is concerned with *continuous* observation and analysis aimed at foreseeing operating problems long before their magnitude compels attention, and at uncovering new opportunities for improvement which otherwise would remain hidden or obscure.

If the initiation of procedures improvements awaits the sword point of crisis or the compulsion of competition, the progress achieved

is likely to take the form of a series of mutations rather than constant, well-balanced evolution. Promising opportunities for cutting costs or improving performance remain neglected, while the changes which are made seldom produce substantial, permanent benefit. Procedures reforms wrought under the pressure of something gone wrong are apt to do little more than solve the immediate problem at hand. And, where the need for action is acute, unsatisfactory compromises must often be resorted to in order to bring the situation under control. But once the patched-up procedure is functioning again—however inadequate or cumbersome it may be—it quickly becomes assimilated in the day-to-day routine as attention is shifted to other problem areas.

It seems worth emphasis, therefore, that the first top-management policy essential to controlling the quality of procedures is that the approach to their development and improvement cannot be a passive, problem-solving approach. It must be a planned, positive approach involving the continuous review of existing procedures to detect evidence of inadequate control, duplication, lack of necessity, excessive performance time, or excessive cost.

2. The second policy—a derivative of the first—is that the program must be *complete*. It cannot be limited to a few basic routines or to the area of accounting activity, as it so frequently is. It must comprehend the paper work of every department regardless of by whom it is performed—whether they be clerks, salesmen, engineers, purchasing agents, or any other.

Figure 2 underscores the need for this over-all approach to the procedures improvement job. It shows the relationship in number of clerical employees among the departments comprising the companies of the Bell System. Although the accounting function employs a larger number of clerks than any other department, the nonaccounting departments contain, in the aggregate, over 65 per cent of all clerks employed throughout the System. In addition, as Figure 2 indicates, since 1950 the clerical forces in these nonaccounting departments have been growing at a much more rapid rate than has that of accounting.

Procedures improvement as a staff activity. It is evident, of course, that there cannot be a positive, continuing attack unless the responsibility for procedures research is fixed and clearly defined. This means that some specific position, or positions, must be made accountable not only for carrying out procedures studies but also for observing the need for such work—for anticipating problems and

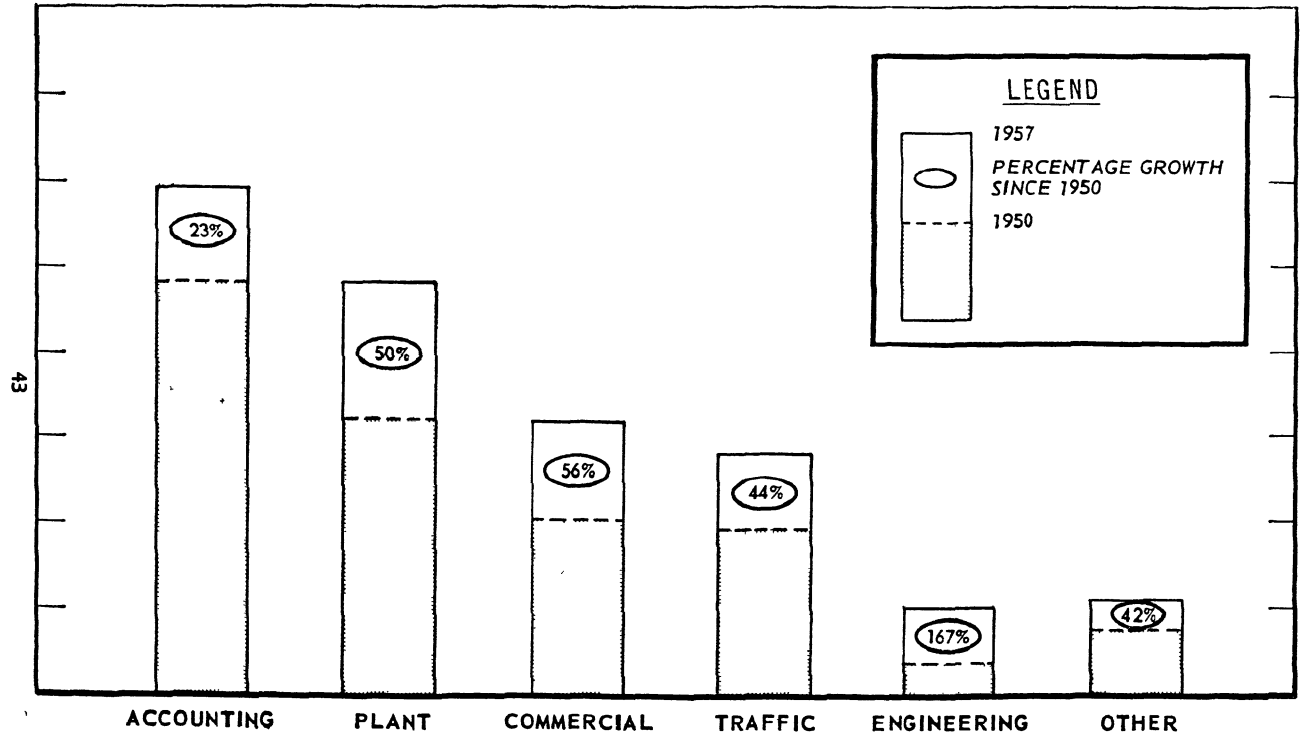


Fig. 2. Clerical Employees by Department of the Bell System Companies

isolating opportunities. It is basic to the success of the program that this responsibility be assigned in such a way that accountability is established over these three factors:

1. Completeness of the program, that is, the problems and projects to which effort is applied.
2. Progress or rate of accomplishment.
3. Quality of procedures developed.

Before determining where to place this responsibility in the organization structure, consideration should be given to one of the practical problems involved in ensuring that sustained effort is applied to the procedures program.

One of the serious obstacles to developing procedures improvements is the pressure of day-to-day operating responsibilities. This is understandable, for the conduct of a procedures study often requires much painstaking research and analysis. The problem must be defined, the facts gathered and evaluated, and the new or revised procedure planned, tested, and installed. The line executive or supervisor seldom has adequate time to devote to this process. Though he may recognize problems that need investigation, he often cannot tackle them because of his absorption in regular administrative duties. Should he take the time to do so, his efforts are interrupted so frequently that he must perforce conduct a hasty, superficial study to arrive at any kind of a solution within a reasonable time.

These circumstances suggest that procedures research be set up as a staff function and that the persons engaged in this work be assigned no other responsibilities. Only in this way are thoroughness and continuity of effort likely to result.

Aside from having *time* adequate to the task, a special staff can bring at least two other forces to bear on the procedures improvement program:

1. *Specialized Knowledge and Skills.* Successful conduct of procedures studies—particularly those involving analysis of clerical methods—requires an extensive fund of information about office machines and equipment. Although the analyst need not be an expert in each of the many types available, he should understand its function and possible applications. In addition, most procedures projects require a practical, working knowledge of forms design principles and techniques. It is difficult to acquire adequate knowledge in these specialized fields except through continuous study and doing.

Similarly, extensive and varied experience in procedures work leads to development of specialized techniques for gathering, organizing, and analyzing data. If skillfully applied by the procedures analyst, these techniques help to produce better results in a shorter time. They tend to ensure that the study is carried out in an orderly, precise manner, that all pertinent facts are considered, and that no opportunity is overlooked.

2. *A More Objective and Critical Approach.* Staff members are likely to approach a procedures problem with more detachment than line personnel. Since they neither perform nor supervise the routine being studied, there is less chance that the thinking they apply to it will be inhibited by tradition, habit, or personal incentive.

In addition to greater objectivity, the very nature of procedures research tends to develop a more penetrating and critical approach. Being fundamentally a process of evaluation and conception, it helps those engaged continuously in its practice to acquire a mental predisposition for questioning what is done and seeking better ways.

These arguments for organizing procedures research as a staff activity need some qualification lest the staff's function be misconstrued. In no sense does the staff usurp the responsibility of the line executive for decision making on procedures matters. Nor does existence of the staff diminish the need for creative thinking on methods and procedures by the operating supervisor. Indeed, much of the staff's success will depend on how well its members work with and through front-line supervisors, relying on their firsthand knowledge of operations, stimulating their ideas, and testing proposals against their practical judgment.

Locating the procedures staff in the company organization structure. Recognition of the need for staff assistance logically gives rise to the question, "To whom should a procedures staff report?" The common and obvious reply, "To the person responsible for final results," leaves the question unanswered. Who should be made responsible for final results? At what points in the company organization structure should responsibility for procedures improvement be placed?

If the answer is to meet the test of accepted organization principles, a clear distinction must first be made between two basic types of procedures—those involving personnel of two or more departments and those confined exclusively to one department.

1. *Inter*departmental procedures are a type of detailed organization plan in the sense that they assign to a specific department the

responsibility for performing each of the major steps in a repetitive process. They also prescribe the sequence and timing of each department's participation; they ensure against avoidable duplication of effort between departments; and they specify the approvals prerequisite to certain types of action.

One interdepartmental procedure common to most companies is the receipt of incoming shipments. This process generally involves participation by many departments, included among which may be receiving, inspection, material control, storeskeeping, purchasing, and accounting. Another such procedure is that governing the preanalysis and control of engineering or design changes in metalworking and assembly industries. This process is not so typical as the first, but it is perhaps more useful as an illustration because of the number and diversity of participating departments.

In one manufacturing company this particular procedure comprises the following three basic steps:

a. Gathering, correlating, and presenting the pertinent facts.
b. Making the decision.
c. Coordinating the preparatory work necessary to putting approved engineering changes into effect.

In each of these three phases, interdepartmental participation is widespread. In the fact-gathering stage, the engineering department is assigned responsibility for determining the effect of the change on product performance and appearance and on the interchangeability of parts. The methods department shares with purchasing and cost accounting the responsibility for determining the effect on labor and material costs. Several departments also participate in determining the quantity and value of material that will be rendered obsolete by the change—the material control department for raw materials and finished parts in stock, production control for in-process parts, purchasing for outstanding purchase commitments covering these items, and accounting for converting the quantity data to dollar values. Finally, the sales division is responsible for determining what effect the design change will have on market receptivity.

The same participation characterizes the decision and implementation phases. The procedure specifies who must approve the design change before it is accepted, and under what special conditions the approval of top management must be obtained. Once the change has

been approved, the cutover in the manufacturing process must be carefully planned. Thus the procedure also provides measures to ensure proper coordination of the preparatory work, so that new tools, jigs, fixtures, patterns, materials, drawings, and operation sheets will all be available at approximately the same time. Finally, responsibility is established for determining what disposition is to be made of obsolete items and for carrying out the decision reached.

It is apparent from examination of this process that sound decision and prompt execution require unity of action by all the participants. The primary function of interdepartmental procedures is to make this unity of action possible. On the one hand, they ensure that no essential part of a given process is left unassigned; on the other, that delays or loss of effort due to duplication, friction, or ungainful competition are held to a minimum. It must be concluded, therefore, that one of the principal objectives of interdepartmental procedures is to promote coordination of effort on recurring matters, so that all branches of the organization function together as a harmonious whole.

2. *Intra*departmental procedures relate to detailed work routines that are wholly departmental in scope; their method of performance or their modification has no direct effect on any other departments. Their function often—though not always—is that of prescribing *how* a responsibility assigned to the unit in an interdepartmental procedure is to be carried out. Thus, for example, an interdepartmental procedure covering the control of capital expenditures may specify that all requisitions to purchase capital items should be reviewed and approved by the budget director to ensure that adequate funds are available in the capital appropriation. The means by which the budget director carries out this responsibility—the records required, the participating personnel, and the flow of documents within the department—all are matters of intradepartmental procedure.

RESPONSIBILITY FOR INTRADEPARTMENTAL PROCEDURES

Within business organizations, the head of each department is normally considered to be responsible for determining the procedures and clerical methods by which the activities assigned to him will be carried out. This responsibility is as indigenous to the department head's function as that of deciding the organization structure of the positions under his line authority or of selecting the people to

man that organization. Though he may seek and accept recommendations on intradepartmental procedures from his superiors or outside specialists, he cannot be relieved of responsibility for decision making in this matter without impairment of his authority. If, for example, the production control superintendent is assigned responsibility for dispatching and following the progress of manufacturing orders through the shop, he cannot properly be relieved of the responsibility for determining how these activities will be carried out or what information he needs to control their execution.

The general principle having been advanced, it now becomes subject to two qualifications: (1) Intradepartmental procedures must not conflict with the activities of other departments or the basic policies of the company. (2) In any multiple-unit operation, such as a chain of retail stores or a company operating several plants or warehouses, standard procedures may be necessary or desirable for the same departmental function in all units. Where this requirement has been made a matter of company policy, the responsibility for procedures determination may be appropriately withdrawn from the local heads of like departments and placed with some central planning group.

RESPONSIBILITY FOR INTERDEPARTMENTAL PROCEDURES

There are three alternative points in the organization structure at which the responsibility for interdepartmental procedures may be placed. Each of these alternatives can be found in actual practice among companies which have undertaken an organized program of procedures work. They are:

1. Assignment of the responsibility to all departments, with provision made for proper clearance and the approval of specific proposals.
2. Assignment of the responsibility to the head of a major function of the business—typically the comptroller or the office manager.
3. Retention of the responsibility by top management.

These three alternatives merit thorough exploration, for hasty, ill-considered choice among them is perhaps the greatest single cause of ineffective procedures improvement work.

ALTERNATIVE 1

ASSIGNMENT OF RESPONSIBILITY TO ALL DEPARTMENTS

Where this alternative has been adopted, each department head is considered responsible for undertaking the development or revision of those interdepartmental procedures which affect his operations to the greatest extent. This arrangement, however, does not preclude any department head from making recommendations on procedures which are of concern to him, to whatever extent. Along with this division of responsibility, some agency is generally set up to ensure that procedures proposals are reviewed and approved by the heads of all departments involved. This may be either a committee of department heads or a staff position to one of the top executives. A final, customary feature is the fixing of responsibility for reducing approved procedures to a standard format (usually referred to as "standard practice instructions" or "standard procedures instructions") and for distributing copies to the executive and supervisory personnel affected by them.

In large companies where responsibility is divided in this way, it is not uncommon to find a number of divisional or departmental staffs engaged continuously in procedures studies. Departments not having a permanent staff generally designate one of their members to work on specific procedures problems as the need arises. One such company had full-time procedures staffs in four of its divisions or departments: accounting, engineering, production control, and industrial relations. In addition, general staff assistants to several other division and department heads spent varying but considerable amounts of time on procedural matters. This group included assistants to the sales manager, director of purchasing, traffic manager, and inspection superintendent. According to an organization bulletin of the company, the assistant to the president was responsible for "obtaining, reconciling, and compiling the views and recommendations of the executives with respect to new or existing policies or procedures." The extent of this responsibility was amplified by another directive which stated: "Division and department heads requesting adoption or revision of policies and procedures will make their recommendations as complete as possible, leaving as little as possible to be done by the assistant to the president. Before sending in recommendations, the originator

should also discuss them with the individuals who will be directly affected."

Arguments favoring departmental responsibility. A number of benefits, claimed to be unobtainable by other means, are credited to this division of responsibility for interdepartmental procedures work. Among those advanced most frequently are the following:

1. Procedures are likely to be more practical from an operating standpoint when each department head has primary responsibility for their development and application in his area. They will be designed and installed by people who have intimate, day-to-day contact with the department's problems and routines.

2. When a procedure is developed by, or under the immediate direction of, the department heads who are to use it, a natural pride of authorship accrues to them. They understand it and believe in its desirability or necessity. It will be followed, not because its use is demanded, but because it is accepted as the most practical way of performing the activity it covers.

3. A department will be better served by its own personnel than by an outside group. Not only can the department head supervise his own staff more readily, but also he has the assurance that it is always available to work on the procedures problems affecting his operations. A staff with outside supervision, on the other hand, might be diverted from the department's problems just when they most need attention.

4. Departmental procedures staffs constitute a source of manpower to handle special, nonrecurring operating jobs which arise from time to time. They also serve as a training ground for supervisory positions within the department.

Basic weakness. The importance of these benefits—particularly the first two—seems incontrovertible. Although it is maintained that they can be realized in full measure through other types of organization for procedures work, there is little doubt that departmental responsibility for this activity produces them most readily. But their value is largely offset by a fundamental weakness in this division of responsibility: It fails almost completely to meet the three control specifications that have already been established as essential to success of the procedures improvement program. When responsibility for interdepartmental procedures is broken up and distributed among all departments, accountability for completeness of the program is wholly lost. No position can be held responsible for observing needs or crystallizing

objectives. Nor can there be any assurance that the most promising opportunities are being exploited, particularly since so many of them lie in the "twilight zone" of interdepartmental relationship.

To the same extent this alternative fails to meet the second specification—that of providing effective means of control over progress or rate of accomplishment. And finally, although the third specification is partially met by having new or revised procedures jointly approved by all department heads affected, this feature is an ineffective means of controlling the quality of procedures adopted.

How does lack of control over these three factors offset the benefits that departmental responsibility produces? The answer lies in the conditions and results arising from an uncoordinated departmental attack on *inter*departmental procedures.

Conditions characteristic of departmental approach. Three conditions can be expected to prevail under this type of organization:

1. *Conflict and Duplication of Developmental Effort.* Two or more procedures staffs are often apt to be working simultaneously on some phase of the same procedures project, each staff unaware that others are engaged in it. On some occasions, this condition arises because each staff believes that the maintenance of a given set of records or the exercise of a given control is the rightful function of the department it represents. At other times, an interdepartmental procedures study, which could properly be started at any one of several points, is, through lack of communication, begun at more than one of these points at the same time. And, in still other instances, a group of projects, which on the surface appear to be of minor importance and of purely departmental interest, become so ramified as they are carried out that each joins the others at departmental boundary lines to become a single major project.

As these duplications of effort become evident, they may lead either to jurisdictional disputes, jealousies, and continued duplication or to constant shifting of responsibility for completing projects from group to group or person to person.

2. *Lack of Effort.* In contrast to duplication of effort, it is equally probable that many gaps will exist in the joint endeavor. Little or no progress will be made in solving some interdepartmental procedures problems because each staff or department is waiting for some other group to take the initiative. However acute the problem, should it involve explosive organization issues or an unsuccessful previous effort at solution, it is likely to provoke much talk but little action.

In other instances, the work of one staff may be completed and shelved for a substantial period of time while awaiting the availability or assignment of someone from another staff to undertake and complete his share of the job. For example, the industrial relations procedures staff may develop a new employee interplant transfer procedure, adoption of which must be delayed until the accounting procedures staff—busy pursuing its own program—develops the necessary supplemental procedure for transferring payroll records. Too often completion of such studies hinges on the passive interest of a group to which the problem is of only limited concern.

3. *Limitations of Departmental Viewpoint.* The majority of departmental executives cannot reasonably be expected to have the breadth of knowledge and interest necessary to visualize all aspects of an interdepartmental problem and to correlate them properly. In no sense does this belittle their talents as departmental managers, for our system of internal business control deliberately fosters a proprietary interest in one's own specialized function. The fact remains, however, that under divided responsibility for interdepartmental procedures, a company-wide point of view is seldom achieved. Nor can it readily be achieved where many groups with widely varying perspective and understanding are independently engaged in defining the scope of a common problem and in hacking away at its isolated segments.

A further impediment to the over-all point of view is the traditional method of conducting interdepartmental procedures studies under this arrangement. Seldom does any one individual get all the facts. Members of one department ordinarily cannot—or, at least, do not—go into other departments to make a detailed examination of the records, reports, and routines bearing on the problem. Rather, the most common practice is for the department confronted with a procedures problem to develop a proposal based on its own information and to submit it in writing to other departments for comment and approval. Not infrequently this initial step is followed by a long series of consultations, counterproposals, committee meetings, and similar efforts at self-adjustment. Though conflicts and differences of opinion may be compromised by this process, at no time does it produce the orderly assemblage and analysis of facts necessary to ensure that the decision reached serves the best interests of the company as a whole.

Results of these conditions. Without unity of thought, purpose, and action in the developmental program, there is little warrant for assuming that the procedures adopted will measure up to reasonable

standards of simplicity, effectiveness, or economy. The principal quality yardstick applied to procedures proposals is whether or not they have been approved by the heads of all departments affected. No guarantee of company-wide efficiency is implicit in this measurement, for as long as one department head gets what he wants, he will seldom presume to challenge another's right to what the latter wants. This is the breeding ground for duplication and complexity. It promotes excessive controls, extra copies of forms, multiplicity of approvals, duplication of records, and circuitous flow of work.

Where unanimous approval is not spontaneous because of a conflict between two or more department heads, efforts at settlement are generally directed toward reaching a compromise that most nearly satisfies the personal objectives represented, rather than toward discovering the real needs of the company as a whole. It is not intended to underrate the practical value of compromise in developing workable procedures as distinct from "perfect" procedures. But under divided responsibility for this activity, the process of bargaining, persuasion, and concession too often concentrates attention solely on the viewpoints of the dissenters. The resulting compromise seldom promotes harmony, nor, except by accident, does it produce an efficient procedure. (This is most likely to be true when the decision goes the way of the most articulate, persistent, or dominant individual.) Were it possible at this point to direct attention to a thoughtful appraisal of how the company's needs could best be served, the compromise reached would, in all probability, not only be sounder and more acceptable to the dissenters, but also promote a more unified outlook.

Nor is the quality of procedures adopted under this arrangement apt to be significantly improved by submitting them to a standing committee of department heads for review. In performing this function, a committee operates under two handicaps:

1. Its effectiveness is impaired by lack of facts. It clearly cannot act as a fact-gathering agency itself. On the other hand, we have seen that divided responsibility for developmental work rarely, if ever, results in expert collection and correlation of all the facts. It is hardly necessary to add that sound decisions cannot be reached by applying many minds to incomplete facts. Neither can the deficiency be compensated for by the random impressions, irrelevant discussion, and snap judgments that otherwise characterize committee work.

2. A committee set up to review and approve procedures proposals will probably be little more successful than its members sev-

erally in overcoming the limitations of departmental viewpoint. In reality it is only a somewhat more formal substitute for the originator's obtaining the necessary approvals individually. To be sure, a committee does bring divergent and specialized opinions together and facilitate the interchange of ideas. But that is not enough. The mere assemblage of several functional points of view does not produce a well-balanced, company-wide point of view. That can be achieved within a group only through a synthesis of thought and unification of objective that are unique to a committee of special interests deliberating a general problem.

Thus the first result to be expected under divided responsibility is that the quality of the procedures finally adopted will fall far short of being the best obtainable. A number of other results must also be anticipated. Among them are the following:

1. The progress achieved on specific projects will be painfully, if not dangerously, slow. Lack of coordination will retard developmental effort. But, because this effort fails to produce a finished study based on all the facts, the time and energy spent in obtaining approvals, reconciling conflicts, and revising proposals will be even greater. The end result, of course, is that costly delays will be experienced in developing adequate controls, adjusting procedures to changed requirements, and launching new activities.

2. For want of a planned, integrated approach, attention will be concentrated on procedural problems, not opportunities. Thus many of the potential benefits set forth in Chapter 2 will not be realized.

3. Executives and supervisors will find their time seriously absorbed by procedural matters. Several different groups will come to them for advice and information on the same problem. They will be called upon to review drafts of conflicting proposals or many redrafts of the same proposal. They will spend time in committee meetings, seeking, by prolonged exchange of opinion, to thresh their way through proposals inadequately supported by fact.

4. Along with costly duplication of effort among procedures staffs, the effectiveness of staff personnel is likely to be impaired by the demoralization that comes from lack of accomplishment. It is unfortunately true that the most competent staff members will be the least willing to continue working in an atmosphere of constant frustration.

5. Installation and effective operation of the procedures finally

adopted will be subject to the same delays that lack of coordination produces in the planning and approval stages.

Reasons for these conditions. In view of their significance to effective business operation, one may wonder why the development and improvement of interdepartmental procedures are frequently left to so cumbersome an organization arrangement. There appear to be two principal reasons:

1. First is the not uncommon belief that efficiency of the enterprise as a whole is ensured by obtaining efficiency within each of its individual parts. In the whole span of administrative practice, there is probably no other more misleading concept than this. It fails to recognize that, while each department may perform its own activities effectively and economically, there can, at the same time, be widespread duplication and triplication among departments. This occurrence is particularly common in large organizations where specialization attains its most highly developed form. Here, both lack of communication and failure to develop sympathetic apprehension of each other's function and needs impose severe limitations on spontaneous coordination. At the same time, the many echelons between related operating groups and a common superior make coordination through authority of the leader equally difficult.

There are few businesses of any size in which overlapping and duplication of activity do not exist. In one company, four departments—storeskeeping, material control, merchandising, and order control—were found to be maintaining records of raw-material inventories. In another, five groups were engaged in the sale of scrap and of excess or obsolete materials or equipment. In still another, three separate records of capital equipment were maintained—each duplicating 80 per cent of the information contained in the others.

These illustrations reinforce the conclusion that efficiency of the enterprise as a whole requires a unified performance that is often considerably more than the sum of its many departmental activities. The great amount of attention that has been given to perfecting skills and techniques in areas of specialization has created a critical need for specialization in the problems of general management. Perhaps the greatest remaining opportunity to increase the efficiency of modern business lies in more effective integration of its pieces.

2. The second reason why responsibility for interdepartmental procedures is so frequently assigned to all departments is the fear that

to do otherwise would not only impair the authority of line executives and supervisors, but also prevent application of their knowledge and judgment to procedural matters. The alternative is somehow conceived to be that of handing down each procedure as a dictum which, at best, will be carried out indifferently by those who did not share in its development and, at worst, will fail to meet the test of actual operating conditions.

In response to this point of view, assurance must first be given that the importance of executive and supervisory participation in procedures development is not only conceded; it is vigorously affirmed. Without such participation, neither practicability nor acceptability of procedures is likely. But, it is contended with equal vigor that those who use this factor as an argument for the departmental approach to improvement of interdepartmental procedures are missing the very point of their own argument. If the knowledge and experience of operating personnel are of such great moment, it is sophistry to maintain that their application should be left to the chance occurrence of spontaneous coordination. If these assets are to be fully utilized, they clearly ought not to be subject to the groping, tentative efforts, the confusion and delay, and the lost opportunities that characterize divided responsibility. Nor should they be dissipated in the haggling and crosshauling that lack of leadership breeds. The only protection against such waste is some planned, systematic means for continuously seeking out and utilizing this knowledge and experience. The choice, therefore, is not between business democracy and dictatorial rule, but between strong leadership capable of developing effective teamwork and muddling, delays, loss of effort, and absorption in corporate politics.

ALTERNATIVE 2

ASSIGNMENT OF RESPONSIBILITY TO THE HEAD OF A FUNCTIONAL DIVISION

In business organizations that have adopted a more positive approach to analysis and improvement of interdepartmental procedures, responsibility for the activity is generally centered in a single position. Where such an arrangement exists, the responsibility is commonly assigned to the head of one of the functional branches of the business rather than to a general management executive. Although the specific

position varies considerably from business to business, the two most frequently designated are the comptroller and the office manager.

The selection of either of these positions is supported by a number of arguments, most of them quite obvious. It is frequently reasoned that the comptroller occupies the only position having a direct interest in all interdepartmental procedures, for few if any of them fail to involve accounting activity in one way or another. Most forms, records, and primary reports support or feed the financial statements and executive reports required by top management for control of assets and operations. For this reason, many people feel that all forms, records, and reports should be compiled according to a plan laid down, or at least approved, by the chief accounting and record officer. This premise leads naturally to the conclusion that all clerical activities and procedures should be under either the direct or functional jurisdiction of the comptroller.

It may also be argued that because the comptroller ordinarily has the largest group of clerical personnel under his line authority, he is likely to have more experience than any other corporate executive in the efficient use of this type of labor.

This last argument is also used to support delegation of company-wide procedures improvement responsibility to the office manager. It is reasoned that an office manager has more opportunity to develop the necessary specialized knowledge of office machines, equipment, and methods than the head of any other function. As one specialist in the field of office management has stated, "Not everyone knows how to run an office." The attention of the purchasing agent, for example, is normally concentrated on maintaining satisfactory sources of supply or developing better ones. The personnel director is a specialist in selection techniques, personnel policies, and labor relations. The chief accountant thinks in terms of accounting principles. Yet each of these positions has under its direction a large group of clerical workers whose effective utilization requires a type of knowledge considerably different from that peculiar to the leader's professional pursuit.

This is the field of knowledge in which the office manager is considered a specialist. Its scope encompasses such factors as the following:

1. The skill and experience requirements for performing various types of clerical operation.

2. The volume of worker production that should be expected on office-machine operations, manual posting, filing, etc.
3. Recent developments in office machines and equipment.
4. How to choose between a manual and machine operation and how to determine the machine best suited to the job.
5. Techniques of scheduling the office work load.
6. Principles of forms design and control.

The tendency to assign responsibility for interdepartmental procedures to the comptroller or office manager also finds support in the deliberations of various professional societies composed of these two groups. Each, in turn, in codifying the functions of its profession, lays claim to the responsibility not only for developing its own routines, records, and reports but also for coordinating procedures and clerical methods throughout the entire organization.

In evaluating this alternative and the arguments supporting it, it will be helpful to reconsider the following three points already discussed:

1. Procedures are concerned with *what* work is to be done, *who* shall do it, and *when* each step in the process is to be carried out. Clerical methods, on the other hand, have to do only with *how* individual clerical operations are performed.

2. Interdepartmental procedures are primarily a means of coordinating the various functional groups comprising a business.

3. Any staff group engaged in procedures work should report to the person responsible for final results.

The first two points taken together lead to the conclusion that development of interdepartmental procedures as a coordinating device requires substantially more than specialized skill in determining the best manual or mechanical means for performing office work. Of what value, for example, would knowledge of clerical work methods be in developing the procedure for control of engineering changes described earlier in this chapter?

In no respect does this conclusion disparage the office manager's contribution to the operation of a business. With his specialized knowledge of office machines and equipment, clerical work standards, and similar factors, he can render outstanding service in helping to increase effectiveness of the clerical work force throughout the entire organization. But service of this character clearly does not encompass coordination of effort among operating groups.

Aside from any consideration of skills essential to discharge of this responsibility, the second and third points listed above give rise to a question of organization principle. Should an office manager, business manager, or comptroller be held responsible for final results in the coordination achieved through development of interdepartmental procedures?

The answer is properly an affirmative one where all departments engaged in paper work are under the line authority of any one of these three positions. Such an arrangement, however, is uncommon among manufacturing companies. It is more likely to exist, though by no means always, in some types of commercial or service business such as banks or publishing firms.

In the absence of this line authority over all activity involving clerical work, the answer must as certainly be negative. Responsibility for coordination means nothing less than authority to make decisions on such matters. And the authority to make decisions on matters of interdepartmental coordination cannot appropriately be exercised by one of the departments to be coordinated. This is the function of a general management executive.

Recognizing where *authority of decision* rests, one question remains. Is the function of the comptroller sufficiently related to general management responsibility to warrant his performing a facilitating role in this matter of coordination? That is, should the comptroller's relationship to coordination be the same as it is to control as an administrative process? Though control is intrinsically a top-management responsibility, its exercise is made possible through discharge of the comptroller's primary duty. It is he who gathers, correlates, and interprets the control data that aid top management and divisional executives to do a more effective job. Should the comptroller be charged to the same extent with the tasks of investigation, analysis, and development of recommendations on interdepartmental procedures as a means of facilitating the coordinative process?

There is no categorical answer to this question. Much depends on the comptroller's position in the organization structure, the character of his administrative job, and the extent of his personal authority as distinct from nominal authority.

Where the office of comptroller is part of a company's treasury or finance division—as it often is—assignment of this responsibility to the comptroller would be a departure from basic precepts of organization. The treasurer performs a financial function just as a director

of research performs an inventive or developmental function; a vice-president for manufacturing, a production function; and a general sales manager, a selling function. A treasurer's function is scarcely more similar to the *general* management of his company's business than is that of the sales manager or any other divisional executive. Therefore, the treasurer should not be assigned a *general* management job any more than should the sales manager.

A second factor to be weighed is the extent of the comptroller's operating responsibility. Not infrequently the comptroller supervises many activities not related or essential to his principal function of compiling and interpreting financial and operating results. These additional activities may include sales-order processing, billing, stock control, office service, and many others of a routine, clerical nature. The more administrative responsibility of this character the comptroller assumes, the weaker becomes the argument that he should perform the procedural investigation and analysis work required for effective coordination. This is true for the following three reasons:

1. As the scope of the comptroller's operating responsibility grows, his department more and more becomes merely one of the functional groups to be coordinated. In the gathering and analysis of facts and the development of recommendations, any functional group working on a general problem is likely to underrate or neglect those aspects which do not directly concern it and to treat as fundamental those which do.

2. If he is overburdened with administration of routine activity, the comptroller has little opportunity to acquire the understanding of company operations necessary to ensure that procedures studies are intelligently conducted and that recommendations are developed in the light of the company's best interests as a whole.

3. Finally, the greater the volume of operating responsibility discharged by the comptroller, the more other divisional executives will consider his position as coordinate to theirs. They will not regard him as operating in a staff capacity to the chief executive, nor will they consider his work as being any more closely related to the general management function than their own. And because of this feeling, they are likely to resent having their activities investigated by the comptroller's staff and having him develop recommendations regarding the scope of their operations.

It may be stated as a general principle, therefore, that responsibility for investigation, analysis, and recommendation regarding inter-

departmental procedures should not be assigned to a functional executive unless, in actual practice as well as in the minds of other division heads, he operates in the capacity of "chief of staff" on this kind of work for the principal executive.

ALTERNATIVE 3

RETENTION OF RESPONSIBILITY BY A GENERAL-MANAGEMENT EXECUTIVE

Although consideration of the first two alternatives has led to rejection of one and qualification of the other, it has at the same time provided the principles on which responsibility for interdepartmental procedures must be based. These may be restated as follows:

1. Interdepartmental procedures are primarily a mechanism of coordination.

2. Responsibility for coordination rests with the leader of the groups to be coordinated. In each division head reposes responsibility for coordinating the departmental activities under him; in the chief executive, responsibility for harmonizing divisional activities and achieving over-all, company-wide coordination.

3. The responsibility for coordination is not divisible. It cannot be delegated to all of the groups to be coordinated. Any attempt to do so is not delegation; it is abdication.

4. The position responsible for decision making on matters of coordination should not delegate responsibility for fact finding, analysis, and recommendation on such matters to one of the functional groups to be coordinated. Facilitating work of this nature should be performed only by someone whose point of view and interests are coterminous with those of the principal and who is accepted by others as an agent of the principal.

5. Responsibility for development of interdepartmental procedures cannot be effectively discharged in a passive way. It requires something more of the leader than his performing a conciliatory function if and when conflicts arise. It requires something more of his staff than that it act as a "clearing house" if and when procedures proposals are submitted. It requires development and execution of a positive, orderly, and continuous program for uncovering needs and seeking opportunities, for planning and organizing procedures studies, for conducting them according to a set of systematic techniques, and for controlling the progress and results achieved.

6. Active performance of this function by the leader and his staff neither impairs the authority of operating executives in their respective areas nor precludes their participation in the development and improvement of interdepartmental procedures. Quite the contrary, under strong, capable leadership "multiple management" should flourish, for it will be continuously encouraged and, at the same time, guided into becoming a vital, integrated force. Conversely, without positive direction from the top, much of the potential contribution from down-the-line personnel is seldom realized. As one executive stated:

> I decided I should give more attention to developing ideas and suggestions for achieving better over-all results but found there was no one to whom I could turn. I tried one member of the Executive Committee and received encouragement, but another turned me down. In the end, nothing happened; so I concluded that, as a practical matter, I had better just sit back and do my own job as best I could.

CONCLUSIONS ON WHERE THE STAFF SHOULD REPORT

The principles of responsibility and the staff concept developed in this chapter lead to the following conclusions on organizing the procedures improvement effort:

1. In principle, staff personnel engaged in *inter*departmental procedures studies should report to the chief executive [1] of a relatively self-contained operating unit—that is, either to the president, executive or administrative vice-president, or general manager of a company; or to the manager of a plant or product division that operates on an autonomous basis in so far as organization structure and procedures are concerned. If the chief executive delegates his supervision of the staff to a subordinate executive, he should do so only under the conditions already set forth.

2. Staff personnel engaged in the analysis of procedures that are wholly departmental in scope should, in principle, report to the head of the department. In its practical application, however, this principle

[1] A general procedures staff, of course, does not need to report directly to the chief executive if the procedures activity is but one of several staff functions serving him. Under this circumstance, the procedures group might well report to a "chief of staff," as is the case in one company where a procedures staff, an organization planning staff, and a control staff all report to the assistant to the president.

requires some amplification. One reason is that any one department may not have enough procedures work to keep one analyst continuously busy. Another reason is that the existence of a number of departmental procedures staffs throughout the company (e.g., in manufacturing, engineering, sales, and personnel) can create major problems of coordination. Even if everyone agrees that these departmental staffs will work on *intra*departmental procedures only, the line marking this limit cannot always be precisely drawn. As a result, conflict and overlapping among such staffs are almost certain to arise.

One alternative for overcoming this inherent problem is to have the company's (or division's) general procedures staff serve the individual departments on internal procedural matters. But, where this alternative is followed, it is important to stress that, *on intradepartmental problems,* the general staff is strictly a service unit. It is available to render assistance as requested, but no department is compelled to use the service. In addition, when the general staff is called upon for assistance on a departmental problem, the member assigned to the project should, for the duration of his assignment, be regarded as a staff assistant to the head of that department.

Where this alternative is not followed, and instead, major departments set up their own intradepartmental procedures staffs, special effort should be made to keep the several staffs properly coordinated. One company achieved this coordination with unusual success by removing all departmental procedures staffs from their respective departmental areas and locating them adjacent to each other in a single area. The natural coordination that grew out of this physical arrangement was supplemented by a regular weekly meeting of the heads of the several procedures staffs.

CENTRALIZATION VS. DECENTRALIZATION OF THE PROCEDURES STAFF

Thus far the discussion has centered on the location of procedures staffs within a single-division company. Hence, the remaining issue to be dealt with is the place of a procedures staff in the organization structure of a multiple-unit business as, for example, a chain of retail stores or a manufacturing company operating several plants or divisions. As a general principle, location of the staff—or staffs—should, in this instance, be governed by the extent of the authority exercised by headquarters personnel over the organization structure,

procedures, and methods of the operating units. But this observation serves only to raise the timeless issue of centralization vs. decentralization as it particularly applies to the problem of procedures control: To what extent *should* the procedures planning function be a headquarters or a local responsibility?

There is, of course, no one arrangement most suitable to all types of organization, just as there is no single answer to the question of centralization vs. decentralization in its broader aspect. All that can be done here, therefore, is to suggest some of the criteria that should govern decisions in individual cases.

The two principal considerations to be weighed are (1) the similarity of products or processes among the various operating units, and (2) the degree of interdependence among operating units or between each unit and the central organization.

The more similar the activities of the various units—as, for example, in a chain of retail outlets or branch banks—the more exchangeable are the procedures developed at individual points. Here, maximum economy of effort is achieved by conducting procedures studies through a central agency.

The role of the headquarters organization in procedures planning will also be influenced by the need for coordinated action between units. For example, if there is a frequent exchange of personnel or a regular flow of work between plants, a greater degree of procedures standardization is likely to be required than if these conditions do not prevail. Similarly, if the central organization includes a number of operating or service departments, such as sales, purchasing, or general accounting, uniformity is desirable at least in those plant procedures that are tied into the day-to-day operations of headquarters groups.

If, on the other hand, the operating units have little in common—and particularly if they are widely dispersed geographically—the presumption is in favor of local control over most procedures matters. Under these circumstances, the alternative of centralized procedures planning produces little economy of developmental effort and often fails to meet local requirements promptly and intelligently.

Within the broad limits indicated by these two sets of conditions, there are, however, few companies that do not require some central control over procedures. Even under the extreme form of decentralization, the headquarters organization must usually establish routines governing the flow of control information to the central authority.

Against this background, the general conclusion to be drawn is that a headquarters staff should be responsible for those procedures which are to be standardized throughout the company, and a plant staff for those which do not need to be standardized. Where staffs exist at both points, it is important that the company policy on procedures standardization be spelled out in enough detail to forestall confusion or disagreement over each group's area of responsibility. In one company, an attempt was made to resolve this issue by publication of a bulletin stating, "Procedures problems or proposals involving more than one plant or a plant and the headquarters organization will be referred to the Central Procedures Staff for handling." In actual practice this statement proved to be little more than an evasion of decision, for it failed to specify the conditions under which a plant procedure *should* be made uniform among all plants. The results were constant jurisdictional disputes and varying unilateral interpretations of the extent of central organization functional control.

Finally, the principles governing the place of procedures staffs in the organization structure of a single-unit company are equally applicable to the individual plants of a multiple-unit company. That is, interdepartmental procedures studies should be conducted by the staff of the unit's chief operating executive—usually the division or plant manager; intradepartmental studies should be conducted by the department head or his staff or by the divisional general staff operating on a service-rendering basis.

DEFINING THE STAFF'S RESPONSIBILITY

The final step in organizing for procedures improvement is to spell out the staff's responsibilities in detail. One of the chronic causes of ineffectiveness and frustration among procedures analysts is vagueness about what the staff is supposed to accomplish and how it is supposed to operate. To avoid this, the persons responsible for creating the staff should reach clear-cut decisions on (1) the basic mission of the staff; (2) its authority for initiating studies; (3) the scope of its coverage. Once made, these decisions should be reduced to writing and distributed throughout the entire managerial group.

Basic mission. This part of the total statement should spell out what the staff is charged with accomplishing. Specifically, is its primary responsibility to be that of

1. Recording existing practices by developing and maintaining a standard practice instructions manual?

2. Standardizing and controlling company forms and office equipment?

3. Achieving uniformity of practice among like units (e.g., retail stores, warehouses, or branch offices)?

4. Straightening out paper-work problems and difficulties as they arise?

5. Cutting the cost and increasing the end-result effectiveness of the company's paper-work processes?

Authority for initiating studies. The second phase of the staff's responsibility that needs clear-cut definition is its authority for getting studies under way. Specifically, a decision must be reached between the following two alternatives:

1. *The Service-rendering Approach.* Under this method of operation, the staff would work primarily on the problems raised or projects requested by operating personnel.

2. *The Programed Approach.* Under this alternative, the staff would initiate most of its own studies through some systematic means for identifying the major administrative improvement opportunities of the business. Even under this alternative, however, no project would ordinarily be undertaken without the agreement of the line executives concerned.

Scope of staff's coverage. Finally, to complete the staff's charter, the scope of its coverage needs to be spelled out. This should be done in terms of two dimensions: breadth and depth. First, how broad should be the reach of the staff's work in terms of the organization units to be covered? Second, in any one study, how deep should be the staff's penetration in terms of the administrative elements to be evaluated? Should it deal with all the factors affecting the complexity or cost of the administrative process—including policies, organization structure, and management information requirements—whenever these factors have a bearing on the process being studied? Or should the staff's work be limited to detailed procedural steps and clerical methods?

Sample statement of responsibility. As an illustration of the job elements just discussed, the published statement of one company's systems and procedures staff's responsibility appears in Figure 3.

Position: Systems and Procedures Director

Reports to Administrative Vice-president

Responsibilities:

1. Takes the initiative in studying continuously all systems and procedures involving more than one department of the company. Recommends and assists in installing improvements that will cut clerical and other administrative costs, reduce errors, strengthen operating or management controls, or speed up performance of the routine.
2. At the request of the department head concerned, studies existing intra-departmental routines and clerical work methods. Makes recommendations to the department head for simplifying or improving these activities.
3. Keeps continuously informed of new developments in data-processing equipment. Undertakes feasibility studies and makes recommendations on the acquisition and application of such equipment to the company's operations.
4. Reviews all existing reports and requests for new reports to ensure that each is needed, that it does not duplicate other reports, and that it is prepared in the most economical way.
5. Makes work-measurement studies as the basis for determining the required clerical personnel complement for each department at varying volumes of work.
6. Reviews and makes recommendations regarding requisitions for the hiring of clerical personnel beyond budget limits and for the purchase of office machines.
7. Controls the ordering of printed or duplicated forms. This responsibility includes:
   a. Evaluating the need for proposed new forms and making recommendations for the elimination or combination of forms
   b. Ensuring that forms are so designed that they can be filled out and used with a minimum of clerical effort
   c. Establishing paper and printing specifications that will result in the minimum production costs consistent with the use to which each form is to be put.
8. Develops, obtains necessary approvals of, distributes, and keeps up to date standard practice instructions manuals covering any procedures that need to be reduced to writing in order to be carried out and controlled effectively. This responsibility includes:
   a. Acting as a clearinghouse on all permanent instructions issued to administrative personnel throughout the company
   b. Seeing that such instructions do not conflict with other instructions already issued
   c. Recording and issuing such instructions in standard manual form.

Fig. 3. Description of One Company's Systems and Procedures Function

Chapter 5

THE TOP-MANAGEMENT APPROACH TO PROCEDURES ANALYSIS

The preceding chapter has dealt with but two of the ingredients in a successful procedures improvement program. They are (1) policies and objectives that reflect a general recognition among key executives of the importance of procedures research as a continuing activity and (2) a sound plan of organization for carrying on the work.

Although these two factors are major prerequisites, they obviously cannot by themselves ensure effective action. They can only provide the framework within which action must take place. If the procedures improvement effort is to produce the most fruitful results, this framework of policies, objectives, and organization must be supplemented by a broad-gauged, fundamental approach to the conduct of the work. In the absence of such an approach, the activity is likely to take the form of random hacking away at the more obvious problems and to achieve only limited savings while neglecting more far-reaching opportunities for improvement.

In its discussion of the barriers to procedures improvement, Chapter 3 spelled out what the basic approach of the procedures staff should *not* be. This chapter, in turn, spells out what the staff's approach *should* be. Essentially, this aspect of the procedures improvement effort consists of the following two elements:

1. The viewpoint, the set of values, or the way of thinking that the staff applies to its work.
2. The way in which it tackles individual projects.

THE TOP-MANAGEMENT VIEWPOINT

The single determinant that most clearly "separates the men from the boys" in systems and procedures work is whether or not the staff

members possess a top-management point of view. The identifying characteristic of this viewpoint is that it continuously focuses attention on objectives of the business as a whole. True, the procedures analyst may frequently be concerned with a problem that is—or at least appears to be—limited to one area of the business. But if he is trained in and dedicated to applying the top-management approach, his mind—consciously or unconsciously—will raise questions such as these:

Am I dealing here with real, underlying causes or merely with symptoms?

What is the tie-in with other parts of the business? That is, can the problem be solved in this particular area or is it affected by requirements and conditions in other departments?

In this situation, what is the relationship among organization, policy, procedure, and method? What is the relative importance of each of these elements in the total solution?

Is this activity or proposed solution clearly worth what it costs or is likely to cost?

How sure am I that a given solution or course of action serves the best interests of the company as a whole instead of merely suboptimizing one of its segments?

From these and similar questions, it can be inferred that the top-management approach is the approach of the businessman rather than that of the technician. Someone has said that the trouble with many business organizations today is that there are too many executives and not enough businessmen. In that statement lies the gist of the definition we seek: the top-management approach is the approach of one whose breadth enables him to visualize the impact of business problems and practices on each other, and whose business judgment enables him quite consistently to evaluate all things in light of their probable effect on over-all end results. It is the approach that leads one to apply to every business problem or opportunity and to every alternative course of action the tough-minded question: What will this do to promote the health, the competitive vigor, and the long-term profitability of this business?

In his book, "The Case Method at the Harvard Business School," [1] Malcolm McNair points out

> William James, a great teacher of philosophy at Harvard during the early years of this century, made a useful distinction between people who

[1] McGraw-Hill Book Company, Inc., New York, 1954.

are "tough-minded" and people who are "tender-minded." These terms have nothing to do with levels of ethical conduct; the "toughness" referred to is toughness of the intellectual apparatus . . . not toughness of the heart. Essentially it is the attitude and the qualities and the training that enable one to seize on facts and make those facts a basis for intelligent, courageous action.

THE APPROACH TO INDIVIDUAL STUDIES

The second element in the top-management approach is the method of attacking individual procedures studies. Specifically, this phase of the approach should be built around the following five steps, taken in the sequence listed:

1. Study the *total procedure*—not just isolated segments.
2. Determine whether the *basic purpose or objective* of the procedure is effectively accomplished.
3. Reevaluate *what work must be done* or earns a profit.
4. Analyze the *indirect factors affecting the volume of work or complexity* of the procedure.
5. Finally, determine the *best method* of performing the essential work.

The total-procedure concept. The paper work of any business, however large or diverse, comprises not more than a handful of basic, serialized processes. Each of these is an entity regardless of the number of people participating in its performance or their place in the organization structure. The unit of study, therefore, should be one of these processes—from beginning to end, through every organization unit and individual contributing to it.

The alternative approach of analyzing organization units separately is but the study of an isolated segment of the whole. It is a piecemeal attack that can produce only piecemeal results. Its accomplishments are perforce limited to the savings that can be obtained from simplifying detailed operations and improving clerical methods within a highly localized area. The total-procedure approach, although offering just as great an opportunity to improve methods, also throws a spotlight on the relationships between jobs and organization units and on the effectiveness of end results. It is in these latter areas that the larger and more fundamental gains can normally be achieved.

The point is well illustrated by the series of steps and the organiza-

tion groups involved in the typical procedure for processing sales orders within a manufacturing company. If a company produces its finished goods for stock, this procedure might consist of any combination or all of the following clerical functions and activities:

I. Order entering and filling
   A. Registering the customer's order and assigning an order number.
   B. Ensuring that orders conform to a predetermined sales-manufacturing plan. This may involve checking orders against branch office, dealer, or customer allotments; summarizing orders by style or model to ensure that they do not exceed raw-material provisions or factory capacity limits on various classes of work; etc.
   C. Editing the order for completeness and accuracy of information and converting it to standard company terms.
   D. Establishing the shipping date if that requested by the customer cannot be met. (This activity, in effect, amounts to establishing the priority of shipments.)
   E. Making adjustments in the quantities, styles, models, or grades ordered.
   F. Determining the plant or warehouse from which shipment is to be made.
   G. Obtaining approval of the credit risk and terms of sale.
   H. Acknowledging the order if shipment is not to be made immediately.
   I. Preparing, distributing, and filing copies of:
      1. Shipping orders and notices.
      2. Change orders.
      3. Back orders.
      4. Packing slips.
      5. Shipping labels.
      6. Bills of lading.
   J. Posting finished-goods inventory records.
   K. Preparing orders to manufacture for stock.
II. Order service
   A. Investigating and supplying information in response to customers' inquiries regarding the status of their orders.
   B. Handling customers' emergency requests.

C. Handling customer claim adjustments.
D. Keeping the sales force informed of the extent to which shipments are falling behind schedule.

III. Invoicing
A. Pricing and extending shipments and customer returns.
B. Computing discounts, freight rates, etc.
C. Preparing, checking, and distributing invoices (or statements) and credit memos.

IV. Record keeping and report preparation
A. Maintaining files or records of:
1. Sales contracts.
2. Open orders and shipments.
3. Returnable containers.
4. Accounts receivable.

B. Preparing summaries and analyses of orders and shipments for sales management, market research, merchandise styling, and similar purposes.
C. Supplying the manufacturing division with information on unfilled orders for production planning purposes.
D. Preparing commission reports by salesman or broker.
E. Compiling sales tax reports.

In companies which manufacture only against specific customers' orders, this list would be expanded by some or all of the following additional activities:

1. Obtaining and transmitting delivery promise dates to sales representatives and customers.
2. Allocating orders to factories.
3. Designating the manufacturing sequence of orders.
4. Issuing production orders to the production planning and control, engineering, accounting, and timekeeping departments.
5. Following up the factory on delivery promises.

It is evident that these manifold activities not only involve almost every department of an organization, but also have a high degree of interrelationship. Each flows from one and feeds into another. By approaching them as a unit rather than singly, the analyst is able to visualize and deal with their relationships more imaginatively. He detects organization problems, duplication of effort, excessive controls, and similar improvement opportunities that otherwise would

be difficult to spot. Most important, his attention is focused not on improving related pieces separately, but on developing a highly integrated process that represents the optimum means for carrying them out as a whole.

There is just one qualification to these arguments for the total-procedure approach. When administrative cost reduction is one of the major goals of a particular study, the process or flow-of-work approach should be supplemented by a rigorous study of each job, that is, all the major tasks making up each job within the procedure being studied. Only in this way will the analyst be sure of uncovering the many "nonintegrated" activities and tributaries to the main stream that the process approach does not reveal.

Achievement of the objective. It has been emphasized elsewhere that a primary purpose of business procedures is to increase the effectiveness of the entire organization by improving coordination, facilitating action, and providing adequate control. Until these end results are satisfactorily accomplished, it is premature and unwise to concentrate attention on reducing the cost of performing the procedure itself. This is true for two reasons. (1) However attractive the direct savings in clerical labor may be, they are often secondary to the savings and benefits that accrue through producing a better end product of the clerical effort. (2) Unless procedures changes aimed solely at clerical cost reduction are evaluated in the light of their effect upon end results, the saving achieved may prove to be wholly illusory. Indiscriminate work elimination in the office may weaken needed controls or retard action sufficiently to produce hidden losses greater than the saving.

There is a tendency among procedures analysts to become so diverted by the lure of laborsaving opportunities as to lose sight of the fact that procedures are but the means to an end. It is hardly necessary to add that the lowest-cost means of achieving an unsatisfactory end result is still an unwarranted extravagance. In developing a top-management approach, therefore, the analyst must make a critical appraisal of how effectively the desired end is achieved before he gives attention to reducing the intrinsic cost of the means.

The varied directions that this inquiry might take are indicated by such questions as the following:

1. Does the procedure for developing delivery quotations to customers produce the information required to ensure that delivery promises are realistic?

2. Does the stock-control procedure provide the means for preventing or anticipating shortages so that production interruptions, constant rescheduling, unnecessary machinery changes, and wasteful emergency purchases are avoided?

3. Does the procedure for handling customers' inquiries regarding the status of their orders provide for rendering a superior form of customer service?

4. In retail stories, does the procedure for handling customer complaints produce the information necessary to target complaint-prevention efforts?

5. Do the invoice-coding and sales-statistical procedures produce the basic internal data required to plan sales strategy, to control selling effort, and to spotlight opportunities for major improvements in the distribution program?

6. Do the field-sales clerical-support activities help to increase salesmen's productivity by maximizing the amount of time salesmen are able to spend in direct-selling work?

7. Does the cost-accounting system supply management with timely, significant, and highly usable information on the reasons for variances from planned profits and the extent of each department's responsibility for these variances?

8. Do maintenance and repair accounting routines produce the facts needed to measure performance on recurring jobs, to plan the optimum amount of preventive maintenance, and to establish equipment-replacement policies?

9. Does the company maintain personnel records just because it is traditional to do so? Have these records been shaped solely by legal requirements and union contract provisions? Or have they been consciously designed as an effective tool for manpower management? Are their content, arrangement, accuracy, and speed of reference such that they facilitate the analyses required for personnel planning and control? Can they be used for analyzing turnover? For forecasting labor costs or determining the effect of rate increases? For carrying out a program of promotion from within? For planning the best mix of labor grades to perform a given function? For supplying the information required to give more conscious direction and guidance to the employment department?

It is true, of course, that where this type of inquiry reveals profitable opportunities to strengthen end results, development of the desired

improvements may have to await more detailed analysis of individual operations. However, the initial step of achieving the mental orientation essential to a sound solution has been taken. Once a thorough awareness and appreciation of the procedure's basic objective have been acquired, the analyst's subsequent work—no matter how detailed—is not likely to spoil his aim or obscure the target.

What work is worth doing? The next logical step in the top-management approach is to reevaluate the work that needs to be done to achieve the basic objective. Here, of course, the analyst's goal should be to eliminate all unnecessary or unprofitable work and all work of marginal value.

This sounds fairly simple, but unfortunately it is not. In fact, it is very much the hardest of the five steps dealt with in this chapter. The reason is that the head of any kind of office activity *does not have to show a profit* on his operations. From the supervisor's standpoint this might seem to be an advantage. But, from the company standpoint, it is a heavy cross to bear, for it does more to inhibit clear, objective thinking than any other condition of business life.

In the face of this built-in obstacle, how does the analyst go about determining what is unnecessary or unprofitable and what is of marginal value?

The answer, in part, is that his whole point of view has to be an imaginative, courageous, venturesome one instead of the typically cautious one. He has to develop the habit of challenging everything that is done instead of accepting it. And, of course, as the other side of the same coin, he must always be ready to take a calculated business risk and to accept something less than perfection.

In addition, to do a good job in this area, the analyst must exercise unusually sharp judgment because, in evaluating a function, it is easy to fall into the trap of mistaking *reasons* for *justification.* The real test of necessity does not lie simply in determining whether a given function serves some useful purpose. Few, if any, activities will fail to pass so limited a test as that. Just about everything that is done serves some purpose or produces some value. Yet it is so often true that anyone defending a given activity begins with an explanation of the *reason* that it is performed and ends with a recitation of the disasters that would result if it were eliminated.

The real test of necessity is whether or not the benefit produced by the activity is greater than its cost. Careful probing into this area of

value-cost relationship often leads to surprising results. It is not uncommon to find that some of the most hallowed business practices least measure up to this standard.

As an illustration, a few years ago, one of the country's largest mail-order houses adopted the practice of destroying all correspondence, shipping papers, and other documents associated with an order as soon as shipment to the customer had been made. Quite obviously, this practice subjects the company to a certain risk that it did not face when it retained these records. Nevertheless, a careful study, conducted over a considerable period of time, revealed that the cost of filing, storing, and searching through this tremendous volume of papers was greater than any losses that would result from not retaining positive evidence of shipment.

But outright elimination of an activity is not the only alternative. If the analyst concludes that the function cannot be entirely eliminated, he should then determine whether the volume of work—that is, the number of transactions or frequency of performance—cannot safely be curtailed.

An example of the potential payout of this line of inquiry can be found in a study of the purchasing function of a large chemical company. One of the functions performed by the clerical staff of this group was the checking of vendors' invoices (unit price charged, terms of sale, and arithmetic computations). Under ordinary circumstances, an analyst might quickly skip over this sort of activity because the checking of vendors' invoices seems so obvious and necessary. Yet, under the discipline of challenging every function, the analyst learned that 61 per cent of all invoices received by the company were for less than $50 each, and, in total, accounted for less than 2 per cent of the dollar value of all invoices received. By maintaining error-detection records on a sample of 7,500 invoices, he found that the invoices amounting to less than $50 each contained only 10 errors which, if undetected, would have netted out to a $30.33 gain by the company. These facts led to a discontinuance of all checking of invoices under $50, which change—in turn—saved six clerical positions throughout the company and $32,000 annually.

Still another type of change that might result from value-cost analysis is in the level or quality of service that is provided. An illustration can be found in the experience of a large consumer-goods manufacturing company that ships its products to wholesale grocers and grocery

chain stores. In order to determine the optimum speed of customer service in processing and shipping orders, the company periodically experiments with different speeds of service for different classes of customers. By this process it determines what is the slowest (and, therefore, the least expensive) speed of service that will not produce a significant number of customer complaints or lost orders.

One final point needs to be emphasized with respect to determining the real profit-making value of the work being studied. To realize the maximum payout from this step, the analyst should acquire the habit of challenging whole functions or major activities before questioning detailed operations. The obvious reason, of course, is that there is no warrant in studying individual operations if the entire function of which they are a part can be eliminated or sharply curtailed.

The hidden causes of work volume and complexity. Very often the cost of a clerical activity is governed less by the method of carrying it out than by such factors as company policy, the requirements and practices of other departments, or the speed and accuracy goals that have been established. These indirect factors affect clerical costs in the following three ways:

1. They can significantly affect the volume of work to be done.
2. They may increase the complexity of a routine by introducing exceptions in the normal flow of work.
3. They may produce peaks and valleys in the work load.

In most procedures studies some attention is generally given to leveling out or reducing the impact of irregularities in the work load. Much less frequently, however, is any investigation made of the factors that determine volume of work or complexity of the procedure. Neglect of these causal factors is as costly as it is pervasive, for analysis of this type can often produce savings that dwarf those resulting from methods improvements.

Two of the most common causes of complexity in business procedures are lack of well-defined policies and laxness in enforcing policies. Whichever the cause, the result inevitably is a large number of exceptions to the normal routine for carrying on the activity in question. This means special handling, extra records, complex controls, higher volume of errors, and delays in the processing of work.

It is particularly important, therefore, when the analyst encounters an excessively involved routine, that he first examine the basic re-

quirements or policies which the routine is intended to satisfy. He will usually find the answer to procedures simplification within these areas and not within the mechanics of the procedure itself.

It is obvious, of course, that neither the substance of business policies nor the manner in which they are executed should be governed principally by the clerical cost involved. But chronic variations in the handling of recurring business matters are seldom the product of considered policy administration. They more often reflect failure to define policies or general lack of understanding of the policies in effect.

An example can be found in an involved billing and accounting procedure that developed in a large service organization from an attempt to keep pace with complex and highly variable sales practices. Few of the policy decisions which had been made were reduced to writing in some permanent form. And, on many sales matters, *ad hoc* decisions were continuously required in the absence of policies in any form. The result was that salesmen had widely different concepts of their authority to commit the company on prices and discounts, billing and payment arrangements, conversion from one type of service to another, and so on.

Repeated efforts to improve performance within the accounting and billing areas were unsuccessful until the company undertook an intensive program of policy review and development. The outgrowth of this program was a written manual outlining the scope and application of each sales policy. Existence of this manual accomplished two purposes: (1) By promoting a clear understanding of what policies had been established and how they should be applied, it made possible the setting up of effective controls to ensure adherence. (2) It provided the uniformity of practice essential to procedures standardization and simplification.

Once the basic causes of procedures complexity have been isolated and, where possible, eliminated, attention should be turned to the factors determining the volume of work or the over-all cost of an activity. Here again the analysis must be company-wide in scope, for these causal factors are rarely under the control of the departments responsible for carrying out the procedure. The size and diversified character of the savings potential in this area are illustrated by the experiences of the following three companies.

The first illustration is drawn from the experience of a light machinery manufacturing company which undertook a cost-reduction

study of all its clerical activities. In the course of his study, the analyst found that the company was manufacturing its detail parts in such small lots (or in such short "standard runs," as they were called) that it was frequently necessary to machine the same part every four to six weeks. Aside from the adverse effect of this practice on manufacturing costs, it also resulted in substantially higher clerical costs. Investigation of clerical routine in five departments—production control, inventory control, cost accounting, timekeeping, and payroll—showed that the work load of a large percentage of the clerks was determined not by the company's total volume of business, but by the number of shop orders processed and, therefore, by the average size of the manufacturing lots.

No more time was required by these clerks to process a shop order, material requisitions, and job timecards for 500 of a given part than to process this paper work for 10 of the same part.

The clerks whose activities were affected in this manner constituted about 60 per cent of the personnel in the five departments studied. Thus, when the average size of the company's manufacturing lots was doubled, the work load of these five departments was decreased 30 per cent.

A second company had a centralized files setup that was maintained by eight file clerks. A study of sorting and filing techniques led to the purchase of sorting racks which saved 4 man-hours a day or half the time of one clerk. Two years later, when the company's office space became critically short, the same filing activity was subjected to a second study. But, on this occasion, the company's records-retention and -destruction policies were analyzed for the first time. This study led to destruction of 40 per cent of the material before it ever reached central files. With this decline in volume resulting from a sound change in policy, the work of three clerks was saved.

The final illustration involves a large processing company whose maintenance and operating stores consist of approximately 25,000 items. Under the pressure of a company-wide program to reduce inventory investment, the storeroom was following a policy of ordering only a 90-day supply of all items but standby parts. A study showed, however, that on a great majority of these items, the acquisition costs of a 90-day inventory were much greater than the carrying costs. (Acquisition costs include the clerical and other costs of purchase requisitioning, purchasing, receiving, and paying for the item.)

On the basis of these facts, the company divided its stores inventory into three classes of items and established for each class a different number of months' supply to be carried—ranging from three to twelve months. This raised inventory investment costs slightly, but it reduced clerical costs sufficiently to produce a sizable saving in the combined total of carrying and acquisition costs.

Not all opportunities that the analyst comes across during this phase of the basic approach will be as far-reaching as the three described. But, at the same time, some opportunities of this type can usually be found in every company. For example, one can often achieve significant savings simply by making relatively minor adjustments in internal operating policies, accounting practices, completion deadlines, speed and accuracy requirements, and so on.

Optimum method of performing essential work. Only after the major steps discussed above have been completed should the analyst undertake an evaluation of the methods by which the essential work is performed. Even on this final step, however, the approach should still be broad-gauged and fundamental instead of narrow and detailed. That is, before becoming preoccupied with simplifying the methods used by individual workers, the analyst should explore basically different methods for carrying out the activity as a whole.

In initiating this final step, the analyst will find it helpful to begin by describing the *basic nature and purpose* of the function under consideration *in as few words as possible.* This, in effect, amounts to model building—creating a schematic diagram or word picture of the essential characteristics of the total procedure. With this picture in front of him the analyst's next step should be a wholly theoretical one. That is, without reference to limitations of existing facilities or personnel, he should prepare a list of all the means by which the function might conceivably be performed. The first round in the process of evaluating these alternatives should then lead to eliminating those that prove wholly impracticable and to digging more deeply into those that seem promising.

It will often be found that final decision on the question of basic methods must be reserved until a detailed analysis of existing operations has been completed and all possible improvements outlined. This is necessary, of course, to obtain a fair basis of comparison since, in considering new methods, maximum operating efficiency is presupposed. Once again, however, initial consideration of basic requirements will reduce the danger of faulty or superficial diagnosis. It will

help the analyst avoid the common error of patching up an existing method which is fundamentally unsuited to the over-all job to be done.

CAUTIONS TO THE PROCEDURES ANALYST

In developing the concept of a top-management approach to procedures studies, primary emphasis has been placed on a delineation of *areas* to be explored. The basic premise is that the analysis should deal with fundamentals, not frills—that it should probe for causes, not merely treat effects. But penetration in sizing up problems and opportunities is not enough. A well-balanced approach also demands of the analyst that his recommendations reflect a practical appreciation of the job to be done and of the personnel resources available to do it. Some words of caution should be added, therefore, lest, in his effort to make a searching diagnosis, the analyst lose his touch of realism in rendering treatment or writing the prescription.

Much has already been written in this and the preceding chapters about the control aspects of business procedures. But, in the zeal for achieving effective control, there is a danger of assuming that the tighter or more encompassing the control is made, the better will be the end result produced. As a practical matter, however, it is as easy to err on the side of developing an unnecessarily precise, and, therefore, a wastefully expensive, control as it is to develop an inadequate, makeshift one. The problem is nothing more or less than that of selecting the proper tools for the job to be done. Machinists cannot work to close tolerances without precision instruments. On the other hand, micrometers are not needed in a box factory.

The second caution is that the developmental effort should be aimed at creating a simple, workable procedure as distinct from a perfect procedure. To be sure, the initial effort should be directed toward developing the ideal. But once that point is reached, reappraisal and modification should be made in light of the skill and experience of the work force and the cost of perfectionism. As one speaker put it, "Hire a few workers to mop the floor so that you don't have to develop a perfect system that will keep 400 people from dropping things on the floor."

This is not an invitation to resort to looseness or expediency or to disregard long-range improvement objectives. It is simply an appeal for common sense in applying theoretically sound principles and techniques to practical business problems.

The final caution is that *top-level* analysis does not mean merely broad-brush analysis. The approach described in this chapter does not excuse the analyst, in any way, from "getting his hands dirty" by digging deeply into underlying details in solving any problem. To be sure, it requires that he think imaginatively and conceptually about the broad administrative problems of his company. But, to the same extent, it demands of him the kind of completed staff work that converts basic concepts into profitable operating realities.

Chapter 6

GAINING ACCEPTANCE OF THE PROCEDURES IMPROVEMENT PROGRAM

By taking the steps outlined in the preceding two chapters, the drawing-board phase of our work has been largely completed. The machine has been designed, and we are now confronted with the somewhat more practical job of building it and making it run. At this point emphasis shifts from problems of design to problems of execution: from planning to doing. Skilled performance in each area is equally essential to achievement, but in each, different factors have to be reckoned with. In a sense, planning deals largely with abstractions—with objectives, structure, and approaches. Execution is concerned with vital forces—with human relationships, attitudes, and interests, as well as with trained technicians actively applying their skills.

This distinction highlights the nature of the remaining ingredients necessary to effective operation. Though there are many factors that cause some soundly conceived procedures programs to fail and others to succeed spectacularly, it is the author's experience that most of them fall readily into one of the following three categories:

1. Relationships between the procedures staff and top management.
2. Technical competence of the staff.
3. Relationships between the staff and operating personnel.

STAFF RELATIONSHIPS WITH TOP MANAGEMENT

Once a procedures staff has been brought into being, its success will depend materially on the maintenance of a sound relationship with the executive in whose area of responsibility it is to operate.

For a company-wide program, this means the chief executive; for a more restricted program, a divisional or departmental executive.

Development of this relationship is a reciprocal matter. It cannot flourish unless each renders unto the other. It requires of the executive that he give his active support to the staff which serves him. It requires of the staff that it merit that support by earning the confidence of its chief.

This is not a new thought. The need for positive and continuing management support of any such undertaking is widely accepted. Its equivalent can be heard wherever papers are read or discussions held about any function that involves several or all departments of a business. Yet such utterances are seldom given specific definition. The thesis having been advanced, it is usually left to stand as a vague and unadorned generality. In this form, it has limited value as a stimulus to management and tempts others to make unwarranted assumptions regarding the nature of the support they have a right to receive. It will be worthwhile, therefore, to consider not only the ways in which management support should manifest itself but also what should not be expected of it.

What "management support" does not mean. Time and again one hears earnest but disheartened procedures analysts insist that they cannot put their recommendations into effect because, as a staff, they do not have the complete and unquestioning support of management. Occasionally this explanation is but a convenient catch phrase to defend lack of accomplishment. More often, however, it is the sincere conviction of determined staff members who see only that badly needed improvements, which they have worked diligently to develop, are bogged down in the indifference, stubbornness, or inertia of operating supervisors. Confronted with these obstacles and convinced of the soundness of their recommendations, analysts frequently reveal a predisposition to favor what seems the quick and logical solution. They feel that management should give the staff full authority to enforce its recommendations whenever other means of securing their adoption have failed. (The word "enforce" is used advisedly, for it is not uncommon to the vocabulary of procedures personnel.) A somewhat less extreme position, taken by others, is that top management itself should exercise whatever authority is necessary to prevent worthwhile improvements from being blocked by sheer emotional resistance. This, of course, is only a euphemistic way of saying that when soundly developed procedures proposals are not accepted

voluntarily, management should "shove them down the throats" of recalcitrant operating personnel.

Fortunately most managements have been diffident about delegating or exercising their line authority in this manner—and justly so. For it is obviously an anomaly to maintain that the coordination of effort can be promoted through pressure or compulsion. But, at the same time, so long as the procedures staff persists in believing that management support is the means of overcoming resistance to specific recommendations, much of its energy will be dissipated by frustration and special pleading.

It is important, therefore, for staff members to understand clearly the nature of their task. Theirs is a twofold job. It is not merely a matter of generating sound ideas through a skilled, technical approach to problems. It is just as much a matter of *gaining the acceptance* of those who will put their ideas into practice. No one would seriously contend that management support should be a substitute for technical competence of the staff. While it may be less apparent, it is no less true that management pressure should not be a "crutch" for the staff's lack of skill in handling the human relations aspect of its work.

This does not gainsay the existence of apathy, lack of cooperation or resistance on the part of operating personnel. These obstacles are real, and no organization is without them. But such factors often loom larger in the imagination than they are in reality. What the analyst sometimes mistakes for unwarranted opposition is but a natural disinclination to "buy" a product that is poor in design or unconvincing in its presentation. In a sense, therefore, the resistance of operating personnel—however subjective it may be—has very real value, for it will challenge the conscientious technician to do such outstanding work that its rejection by any of the persons concerned would be recognized by the others as pure obstructionism.

In any event, management support should not be construed to mean either the assumption of management's line authority by procedures staff personnel or the placing of undue reliance on the top hierarchy for decision making as a substitute for reaching general agreement at lower levels through the efforts of the staff.

What "management support" does mean. Management support of a procedures program means *belief in and cultivation of an idea*—the idea that continuous adaptation, simplification, and improvement of business procedures are essential to operating effectiveness and

that the effort exerted toward this end must be carefully planned, thoroughly integrated, and competently directed. Diffusion of this idea throughout the organization cannot be accomplished by passive means. It requires sustained action of a kind which only top management can take and without which procedures work must, perforce, be carried on under the most disheartening handicaps.

Here, specifically, are the things that top management must do to fulfill its role. (These responsibilities apply equally to the general executive sponsoring a company-, division-, or plant-wide procedures program and to the departmental executive having his own procedures staff.)

1. *Stimulate among the entire executive and supervisory force an understanding of the problem and the opportunities it holds, and a will for united action.* This is the nature of leadership. It is not just a matter of the chief executive's accepting an idea, but of his communicating and interpreting that idea in a way that gives it power and substance to those who must carry it out. Efficiency, coordination, and control begin with top management's determination to have them. They are an attitude of mind that top management must not only adopt consciously but also transmit consistently to all other levels of management.

Development of this attitude is not a one-time job. It must be worked for continuously. To be sure, a good start can be made by a wholehearted expression of management interest and encouragement at the time the procedures improvement program is launched. But the real problem is to ensure the durability and intelligent application of a concept by gradually building it into the thinking habits of key personnel. This is a job of executive and supervisory education. It cannot be achieved by any means other than consistent, requiring leadership, and without it there is little possibility of real success.

Following are some of the specific attitudes and understandings that management should seek to foster through this process of education:

a. A full appreciation throughout the organization of the part that procedures play in the running of a business.

b. Recognition of the need for continuously questioning and improving operating procedures and adapting them to changing conditions. To help achieve this objective, management must encourage the development of a bold, challenging point of view instead of the normally defensive one.

To that end, the written management philosophy of one company contains this statement:

> As a management team, we seek the development of an open, inquiring state of mind. We are dedicated to bringing the research point of view to bear on all phases of our business. We are never satisfied with things as they are. We assume that everything and anything—whether it be performance results, product, procedures, or methods—can be improved.

The chief executive of another company underscores the need with these words:

> Top management must work hard to create an atmosphere of receptivity to change. It is important to make change, or more accurately the consideration of change, fashionable.

c. A clear understanding of the responsibilities of both line and staff for the success of the program. This means, first, that the basic attitude of line management must reflect not just a willingness to endorse the program or to cooperate with the staff—but a willingness to assume a good part of the responsibility for seeing that worthwhile results are in fact achieved. At the same time, the line organization must understand that if the procedures improvement effort is to be orderly, continuous, and company-wide, it must be planned, organized, and spearheaded by staff specialists.

d. A knowledge of how widespread the scope and objectives of the procedures improvement program are. This is essentially a job of dispelling the misconception that the program is limited to the office area or to the reduction of clerical costs. The opportunities and areas of application discussed in Chapter 2 should serve as a useful check list in raising the organization's sights on this matter.

e. A determination that the procedures improvement program will not amount merely to a "raking of leaves here and there," but that it will be a dynamic force in the management of the business. Its primary goal should be thought of as that of ensuring that the management of the administrative functions is at least on a par with the management of the company's production and sales functions. In addition, if the program is to have any real substance, everyone must understand that the ultimate payout comes not from making changes but from consistently *cashing in on them.* This means, for example, that the organization must discipline itself to convert work eliminations into realized savings through payroll reductions.

f. An insistence that the entire management force acquire the habit of thinking critically and objectively about the true profit-making value of the work that the organization units under them are doing.

g. A realistic recognition that the most significant savings cannot be gotten for nothing. Ordinarily a real price has to be paid for them in terms of giving things up, taking some calculated business risks, and making some courageous, difficult decisions affecting status symbols and traditional practices.

h. A realization that top management has a continuing interest in the program. One of the most practical means of demonstrating this interest is to recognize and reward the operating manager who does an outstanding job of streamlining his own procedures or of co-operating with the staff on a broader project. This is the only step that will ensure *continuing* vitality in the procedures improvement program. For, regardless of the resolution and enthusiasm with which such a program may have been launched, down-the-line personnel will judge whether management means what it says by the way it acknowledges and rewards good performance.

2. *Learn how to guide and use the staff.* This is a particularly important responsibility of the line executive with respect to a procedures staff. Other types of planning staffs normally work more closely with their chief. They exist principally to increase his personal effectiveness; they have frequent contact with him and get most of their assignments directly from him. A procedures staff, on the other hand, receives many of its requests for service from other sources. So long as these can be fitted into its schedule, they are seldom discussed specifically with the chief. The balance of its work is made up mainly of projects originated by the staff itself as part of a master plan previously approved by the chief. Even on projects that the superior himself initiates, the staff may work for long periods of time before reaching a stage of completion suitable for discussion with him.

These circumstances tend to break down the communication without which top management's initial interest and understanding are soon dissipated. Although this consequence may not seem serious in itself, it is quickly reflected in the diminishing enthusiasm of other executives and in the growing suspicion that the staff has lost the endorsement of its superior.

Much of the responsibility for overcoming this hazard rests, of

course, with the staff. But, again, the responsibility is not entirely a unilateral one. It must also be shared by the executive. And because of the circumstances peculiar to procedures staff operation, something more than normal effort is required of both to ensure maintenance of a sound working relationship between them. The part that the staff should play is discussed later in the chapter. Following are some of the specific steps that the executive can take in shouldering his share of the responsibility:

a. Review the procedures project program in detail with the staff leader to ensure that it has been carefully thought through, that it gives adequate emphasis to the procedural phases of major top-management problems, and that, in general, it provides for applying effort to the areas that need it most.

b. Learn to recognize which of the problems growing out of discussions with other executives or revealed by operating reports should be turned over to the procedures staff for study.

c. Take the time to follow the progress of the program at regular intervals in order to ensure that it is being effectively administered. This means making certain that the staff is not straying from its defined objectives or tackling problems outside the scope of its operation, that the program achieves and maintains momentum, and that it does get results.

d. Learn enough about procedural mechanics and the techniques of procedures analysis to appraise the quality of the staff's work. This does not mean that the management executive need become a procedures expert. It simply means that with regard to the staff's approach as well as its recommendations, he should be able to apply, intelligently, a few basic criteria that will keep him from "buying a pig in a poke."

3. *Finally, see that the staff gets a fair chance to do an effective job.* This responsibility imposes two requirements on top management:

a. Management must first give the procedures staff sufficient *time* to prove itself. The newly established staff is confronted with a major task of gaining the confidence of operating personnel. If the staff was recruited from company personnel with the proper basic qualifications but with limited experience in procedures analysis and design, it will also be faced with the job of developing a certain amount of technical know-how. There are few short cuts it can take in achieving either of these goals. Both are essentially matters of education, and educa-

tion is a slow process. But until both are achieved, the procedures program itself cannot be hurried without inviting failure.

At least during the staff's first year of operation, its attention must be concentrated largely on gaining acceptance—on "selling" its services and, in turn, winning the voluntary participation of operating executives and supervisors. This means that it must "make haste slowly"; that while it is sizing up the attitudes of key personnel, it must operate unobtrusively and modestly; that it should cut its teeth on relatively minor and noncontroversial projects in order to avoid meeting major issues or infringing on entrenched proprietary interests at the very outset. In addition, the staff should take time to do its first several jobs with extreme thoroughness both to avoid early criticism of its approach or recommendations as well as to provide ample opportunity for developing or testing its techniques.

For these reasons, management must come to understand that if the procedures staff is to build soundly, it must be given the chance to build slowly. Its performance during the first year or two of operation should be judged not so much by the number or importance of projects completed as by the progress it has made toward developing sound relations within the organization. During that period the staff members will likely make a number of mistakes. How serious these mistakes are should rest not so much on their immediate significance as on whether or not the staff members readily recognize, admit, and profit by them.

Unless the top-management group is sufficiently serious in its intent to adopt and hold to this long-range view it would be better never to undertake a planned procedures improvement program. To start the program and abandon it within a year for want of spectacular results would, in all probability, do more harm than good.

b. Giving the staff a fair chance to prove itself requires next that top management take the steps necessary to *facilitate decision making.* This is a matter (1) of working out with divisional and departmental executives a simple but adequate pattern of approvals required on procedural recommendations and (2) of "keying up" the organization to reach decisions on such proposals within a reasonable time.

In one manufacturing company that lacked this clarification and incentive with respect to decision making, procedures staff personnel spent about 40 per cent of its time on the creative phase of its work and the remaining 60 per cent on attempts to obtain final decisions. Considerable uncertainty existed as to whose approval had to be

secured. Thus, to avoid criticism, staff members sought to obtain the approval of many persons and then to resolve the conflicting views presented. Against this background, the review and approval of procedures proposals simply provided the opportunity for political maneuvering and self-assertion. Action on important questions was often delayed by minor issues raised by persons whose authority over the matter was assumed rather than granted. These impediments not only reduced the staff's total output but also caused confusion, discouragement, and loss of creative drive among its personnel. One staff member aptly characterized the problem by saying, "No matter how good a procedure we develop, when we come to getting decisions and action, it's like trying to tie a rope around a pile of sand."

Staff responsibility for relationships with top management. So much for the part that top management must play in giving support to the procedures staff and its program. If the staff is to merit that support, what specific steps must it take to earn the confidence of its chief?

In large measure the answer, of course, lies in the accomplishments of the staff. We have already seen that achievement in the field of procedures research is not determined solely by the quality of the ideas developed, but equally by the extent to which those ideas are accepted and put into practice. It is logical to assume, therefore, that the confidence of top management in its procedures staff will be influenced materially by the staff's technical proficiency and by the soundness of the relationship that the staff develops with operating personnel. But before evaluating these two factors, it is appropriate here to consider a third—the manner in which the staff conducts its day-to-day relations with its chief.

An important point for procedures analysts to remember is that they are *assistants* to a line executive; that their staff exists to supplement him, not to create more problems for him. However important an organized procedures improvement program may be, the staff's responsibility is to make certain that the participation and support required of its chief do not become onerous to him. To bog him down in the details of carrying out the program would force him to neglect his responsibility for policy formulation and broader planning which are, perhaps, the principal sources of corporate growth and strength.

Here are some of the steps the staff should take if it is to become a blessing rather than a curse to its chief:

1. Learn his point of view, his way of thinking, his set of values and seek to apply them in the development of recommendations as well as in contacts with other executives.

2. Take the initiative in drafting and getting the chief executive's agreement on a statement of the staff's basic mission and its scope and method of operation.

3. Achieve a frank understanding with the chief executive on the barriers to procedures improvement work and the parts that both he and the staff will play in overcoming or minimizing these obstacles.

4. Make it easy for the chief executive to indoctrinate other executives in the objectives and importance of the procedures improvement program by preparing material he can use for this purpose. As a check list in developing this material, the staff will find it useful to refer again to the discussion, under "What management support does mean," of the attitudes and understanding that top management should seek to foster among key personnel.

5. Plan the staff's project program in such a way that some part of the effort is always devoted to matters of real interest and importance to the chief executive.

6. Do not undertake, without the chief executive's approval, any major project that is inconsistent with the program previously agreed upon with him.

7. Develop, at regular intervals, the summary information top management needs to evaluate staff progress and results achieved.

8. Be sure that the staff's demands on the chief executive's time are necessary and purposeful. Avoid running to him with every minor conflict or problem but, at the same time, keep him adequately informed on matters in which he is vitally interested. Reach agreement with him on what these matters are. Generally, they will include the staff's master program, summary reports of progress, highlights of major projects brought to completion, conclusions and recommendations on projects that he has requested, and important areas of disagreement among operating personnel that the staff has not been able to resolve.

9. Adhere to the standard of *completed* staff work in preparing for meetings with the chief executive. Think through the subjects to be covered and organize the major points so that they can be presented clearly and forcefully in a few minutes. Above all else, never present a problem to him without recommending a carefully thought-out solution.

TECHNICAL COMPETENCE

Proficiency in the diagnosis and solution of procedural problems is the product of three factors commonly regarded as prerequisites to successful planning of any kind. They are (1) proper mental qualifications, (2) specialized knowledge, and (3) perfected techniques. It will be of value to explore these factors briefly as a guide to development of staff selection criteria and training objectives.

Mental qualifications. Observation of the work habits and type of thinking employed by highly competent procedures analysts usually discloses the following basic mental faculties:

1. *A Logical, Analytical, and Perceptive Mind.* These qualities are reflected in his ability to isolate and define the real problem, to see beyond symptoms to fundamental causes, to approach the gathering and analysis of data by orderly processes of thought, and to detect obscure but significant relationships among the data obtained.

2. *Ingenuity and Imagination.* These are required not only in conceiving original solutions and detecting opportunities to apply established methods, but also in visualizing the probable consequences of each alternative considered.

3. *Good Judgment.* This is essential in evaluating the relative importance of factors bearing on the problem and in recognizing the real business consequences of alternative courses of action.

These qualities of the mind should be regarded as controlling factors in recruiting a procedures staff. Although natural ability along the lines indicated can be strengthened through training and experience, it cannot be created by these processes. For that reason, proper mental qualifications, together with certain behavior characteristics discussed in the next section of this chapter, must be considered selection criteria and not staff development objectives.

Specialized knowledge. The procedures analyst should be thoroughly indoctrinated in the fundamental principles of business organization and control, procedures formulation, and work simplification. In addition, he must have a practical, working knowledge of the various types of office equipment. This does not mean, of course, that he need be an expert in each type. But he must be sufficiently informed about the uses, operating characteristics, and limitations of each to be able to develop sound equipment applica-

tions. Finally, his specialized knowledge should cover the other two physical tools used in performing the clerical function—space and supplies (of which the most important is business forms). Specifically, his knowledge in these areas should consist of the principles of office layout and forms design.

Perfected techniques. The third factor bearing on the technical excellence of the staff's work has to do with *how* it conducts its studies. This is partly a matter of general approach to procedures problems (which has been covered in Chapter 5) and partly a matter of technique. The chapters comprising Part 3 are devoted mainly to an exposition of formalized and tested techniques for carrying out each step in a procedures project. It will suffice, therefore, to say here that although a sound, general approach must be considered the more fundamental requirement, the development of systematic techniques is by no means unimportant. The gathering and analysis of procedural data in a predetermined, orderly, and precise manner, instead of in a hit-and-miss way, produce benefits of three kinds: (1) They speed up performance of the work. (2) They tend to improve the quality of the final product by promoting greater thoroughness—by ensuring that all significant facts are gathered and all types of improvement possibilities explored. (3) They do much to make operating people conscious of improvement opportunities and to educate them in analyzing by themselves the procedural activities in which they are engaged.

The last two factors named—specialized knowledge and techniques—should be viewed principally as staff training needs. Although it is desirable, of course, to recruit the staff from candidates who have had previous experience in procedures analysis, this requirement should be secondary to mental and personal qualifications as criteria for selection.

But even when these basic qualifications are satisfied, the staff director must not make the mistake of assuming that on-the-job coaching of new staff members during their first few assignments is enough to overcome their initial deficiencies. If the technical competence of the entire staff is to be maintained at a high level, there must be an organized and continuous training program. The third section of this book is aimed specifically at supplying a guide for the development of such a program.

There are, in addition, a number of other sources on which procedures analysts should draw to supplement their own experience

in both the human relations and the technical phases of their work. Many of the universities in our larger cities offer night school courses in the development and improvement of business procedures. Business periodicals and meetings of professional associations offer increasing opportunities to keep in touch with current thought and practice on procedures matters in other companies. Finally, the staff should build up a file of reference material on such subjects as office equipment and supplies, forms design, procedures charting techniques, typical performance times on common clerical operations, and so on.

STAFF RELATIONS WITH OPERATING PERSONNEL

Notwithstanding the obvious importance of technical competence, it is unfortunately true that the more proficient the staff becomes in this respect, the more difficulty it is likely to encounter in gaining the cooperation of operating personnel. Although the mediocre staff may not produce spectacular results, by the same token, it is less apt to disturb old habits or probe sensitive spots. But the more penetrating the analyst's observation of problems and the more fundamental his diagnoses, the greater is the danger that his efforts will incite suspicion and resistance.

This danger cannot easily be avoided, for it is inherent in the very nature of the work. On the one hand, the task of the procedures analyst is essentially that of looking for weak spots, of constantly seeking better ways for others to do their jobs. By virtue of his interests and experience, he generally possesses a highly developed critical faculty. Thinking only of the benefits to be achieved or the credit to be gained through adoption of his plans, he becomes impatient and irritated by delayed acceptance or indifferent execution.

On the other hand, the operating executive or supervisor is just as prone to feel that investigation of his activities by an outsider may amount to tacit deprecation of his own performance. Sensing an implication of criticism, he is quick to point out the analyst's lack of knowledge about the subject being administered, and slow to recognize the compensating value of specialized knowledge about procedures as a technique of administration. And the more fruitful the ideas developed by the analyst as a result of the study, the more resentful the supervisor is likely to feel for not having thought of them himself.

If the procedures staff sees its responsibility as consisting not

only of developing ideas but also of stimulating their adoption, it will neither ignore these natural handicaps nor regard them with pessimism. Rather, it will give as careful thought to obtaining the emotional and intellectual sanction of its recommendations by operating personnel as it does to performing the technical phases of its task. Without such acceptance, the constructive changes made as a result of its work are not likely to be substantial, either in numbers or importance. At best, the staff must suffer passive cooperation or indifference. At worst, it might encounter open antagonism, willful sabotage of its work, or the spreading of harmful rumors about its objectives or competence.

The extent to which the operating personnel voluntarily accepts and carries out procedures recommendations is directly related to the following five factors: its understanding of the staff's work; its participation in that work; the recognition it receives; its confidence in the staff, and demonstrated results achieved by the staff. Subsequent chapters offer suggestions on practical ways of achieving these objectives during each of the several steps of a procedures project. The discussion here will be limited, therefore, to what these factors mean in actual practice and how they contribute to the staff's effectiveness in stimulating profitable action.

Understanding. Only an exceptional program or plan makes its underlying objectives self-evident to those who have not participated in its formulation. Though the mechanics of a proposed course of action may be clear enough in themselves, the attitudes of those whom it affects will be largely determined by their understanding of the purpose behind it and of the need or justification for it. In short, acceptance depends not so much on an understanding of *what* is to be done as on *why* it is to be done.

The responsibility of top management for spreading this kind of understanding has already been discussed. Its educational and promotional effort must be focused, for the most part, on the objectives of the procedures program as a whole, the need for it, and the logic of having the activity spearheaded by a staff group. But the real test of acceptance will be found in the attitudes of operating executives, supervisors, and workers toward specific projects affecting them personally. To the staff itself, therefore, falls the responsibility for sharing its knowledge with the operator—for ensuring his understanding of the reasons for each study, the way the study will be

conducted, and the help he will gain from it. This is the staff's starting point in overcoming the uncertainty and suspicion that foster resistance.

Participation. Human nature is such that if one is asked to work on his own idea, he will do so in white heat; if he is asked to work on the idea of another, he will do so indifferently. There is no greater stimulus to the adoption of procedures improvements than having had those who must carry them out participate creatively in their development. The measure of one's interest and enthusiasm with regard to new operating techniques is generally determined by the extent to which he can identify them—at least in part—as the product of his own thinking.

This, in itself, would be reason enough for the procedures analyst to avoid the temptation of relying exclusively on his own versatility or self-sufficiency. But there are other equally compelling reasons for his encouraging participation of the line organization. The first is that operating personnel can make a real contribution to the undertaking—a contribution for which there is no adequate substitute. The analyst's special function is that of applying systematic techniques to the diagnosis and solution of procedural problems. The operating supervisor's peculiar talent, on the other hand, lies in his intimate knowledge and experience with respect to existing activities and problems. These two elements complement each other, and their full utility is realized only when they are merged. Once that is achieved, the development of improvements becomes the function of both. There are no proprietary rights to the generation of ideas.

Thus, quite apart from considerations of strategy in gaining acceptance, the procedures staff must seek line participation as a means of building a better product—one that will meet the test of operating realities. Staff members must develop the conviction that their work calls not for highly individualized diagnoses and independent thinking, but for a synthesis of all the intellectual resources that can be brought to bear on the problem. In relative effectiveness, it is the difference between a sniper and a task force.

In no sense does this relieve the staff of responsibility for final results. It simply means that the staff's work must be conducted in such a way that the cumulative knowledge, experience, and judgment of the operating organization are tapped.

In addition to improving the quality of end results, participation

of line personnel usually speeds up the conduct of procedures studies and thus further multiplies the staff's effectiveness. The survey phase is facilitated by operator knowledge of sources of information and by operator assistance in gathering data. If conclusions and recommendations are reached jointly, elaborate written reports and lengthy discussions are less likely to be required in obtaining final approvals. If operating personnel has acquired adequate background throughout the course of the study, it can usually carry out the installation phase of the project with a minimum of guidance from the staff.

The final inducement can be found in the benefits that accrue to operators themselves from participation in procedures projects. This experience tends to develop closer teamwork among them and to broaden their points of view. It heightens their interest in procedural matters. By being exposed to the use of rational techniques, they learn to think more analytically and to act with greater effectiveness on their own problems.

An illustration of one method of putting these concepts into practice can be found in the experience of a large, multidivision consumer-goods company that has one of the most successful systems and procedures programs known to the author. In this company the procedures staff has purposely been kept small (with never more than three or four analysts) because its members see their function not as one of doing all the procedures work themselves, but one of organizing teams of staff and line personnel to carry out individual projects. Each such team ordinarily includes only one procedures staff member, but it may consist of from two to five operating men assigned to work full time on the project.

Under this arrangement, the procedures staff still performs the functions of planning the company's over-all procedures improvement program, exploring opportunities and identifying specific projects to be undertaken, organizing study teams, contributing its own ideas, bringing in new ideas and approaches from outside sources, and steering the team to successful completion of the study.

In addition, however, here are the key steps that the study team takes as a group to help its line members feel a true sense of participation and responsibility:

1. The team defines, in specific terms, the objectives of the study. For example, one study of sales-order-handling procedures stated the objective as follows: "To develop a system under which, as a matter

of regular routine, sales orders can be processed and placed in the hands of the shipping department within four hours of their receipt by the company mail room."

Aside from promoting a common understanding of exactly what the team is trying to accomplish, the big value of this step is that it is the beginning point in gaining active support. The operating people themselves have, by implication, recognized the opportunities and created the challenge to exploit them.

2. Next the study team typically develops a list of all the ideas to be explored; that is, a list of all the alternative ways by which each function and each operation might conceivably be simplified or speeded up.

3. Then, without trying at this point to judge the merits of any one of the alternatives, the study team prepares a list of all the facts needed or steps to be taken to evaluate each alternative.

The principal value of the second and third steps is that, from the viewpoint of operating personnel, they remove the shock of ideas that the procedures staff would otherwise have had to advance itself. Hence these steps help to create a predisposition toward change before the study itself is scarcely begun.

Lest the analyst assume that substantial participation by line personnel is the quick and easy solution to all his problems, some words of caution must be added. This method of operation is not an entirely "unmixed blessing," and it requires adroit handling by the procedures staff to keep the study from becoming a vehicle for promoting the line man's preconceived ideas.

Three other more specific limitations and dangers must be recognized. First, line personnel of the right caliber will not always be available to work on the study. Where this is true, it is better for the procedures staff to carry out the study itself than to accept for the project team operating personnel who do not enjoy the confidence of their line associates. Second, the analyst must recognize that by working with operating personnel for substantial periods of time, he may tend to lose—or, in the minds of others, appear to lose—his objectivity and impartiality. Third, the use of persons who are unskilled in procedures analysis, as well as subjectively involved in the activity being studied, can downgrade the quality of the procedures improvement effort.

These, however, are not arguments against an appropriate degree

of line participation. They simply emphasize the need for alertness, courage, and skillful leadership on the part of the procedures staff members.

Recognition. The importance of giving adequate recognition to those one wishes to persuade is sufficiently obvious that it needs mention only to indicate the forms that such recognition may take. The most common form, of course, is in acknowledging cooperation received and in giving credit for ideas contributed. The important thing for the staff to remember, however, is that appreciation expressed to the contributor is courtesy; credit given to the contributor before others is recognition. Procedures analysts will do wisely to be neither careless nor reluctant about this matter, for nothing will destroy their standing with operating personnel more quickly than the piracy of ideas—however unintentional it may be. Nor need the analyst fear—as some do—that his own reputation will be diminished by the recognition others receive from the assignment he has carried out. It is surprising how a readiness to give generous credit to others reflects even greater credit on the donor.

Another form of recognition lies in making use of the suggestions received from operating personnel, whether these ideas have to do with the manner of conducting the study or the procedural plan developed from it. This is not always possible, of course, but in any event a sincere effort should be made to adopt each suggestion received or modify it to a usable form. If some cannot be used, the reasons should be carefully explained to the contributor.

The final form of recognition has to do not with the contributions made but with the place occupied in the organization structure by those whom the study affects. This might be termed the *recognition of position.* It simply requires of the analyst that he avoid "running around end"—that he make all his contacts from the top down through each executive and supervisor concerned.

Confidence in the staff. It is reasonable to assume that the confidence of operating personnel in the procedures staff will be substantially influenced by the staff's technical competence—by its reputation for doing each job as well as it can be done. But in its effort to gain acceptance, the staff cannot afford to rely solely on the "authority of its ideas," for, to an even greater extent, perhaps, its relationships with the line organization will be governed by the personal conduct of its members. This means something more than mere tact or the quality that is loosely referred to as the "ability to get

along with people." It is a composite of many factors which add up to faith in the integrity of staff members and to a comfortable feeling toward them and their work.

It is not intended to recite the many personality and character traits generally considered necessary to achieve these ends. Rather, it is hoped that the practitioner will profit more from a consideration of the type of conduct that begets confidence. In all likelihood, he will gain more practical value from thinking in terms of what he must *do,* rather than what he must *be.*

If the line organization is to have faith in the integrity of the staff, its members must establish a reputation for intellectual honesty and fair dealing. This is not only a matter of honoring confidences, but also of seeking the correction of unsatisfactory conditions by working out their solution with the supervisor directly concerned, rather than by making them known to his superiors.

A second requirement is that the staff avoid playing corporate politics or even giving the appearance of it. This is not easy because politics within a business organization revolve around position, functions, and responsibilities, and these are the elements with which the staff must deal in its work. Procedures changes are one of the means through which the manipulator seeks to gain personal advantage.

Two general rules of conduct, however, will help the analyst escape political involvement: (1) Avoid discussing personalities. Particularly, do not seek to gain favor with one by concurring in his adverse opinion of another. (2) Be completely impartial in the formulation of recommendations. Even those individuals who are encouraging the recommendation of changes that are advantageous to themselves will respect the analyst for being entirely impartial and will realize that if he has not favored them he is not likely to favor others.

The third measure of the staff's integrity in the minds of operating people is the action taken by the staff on their suggestions. This point has already been covered, but it is worth emphasizing here that if the staff is not sincere in its intent to incorporate worthwhile suggestions in its recommendations, it would do better not to solicit them at all.

Finally, the staff must be conservative in the promises or claims it makes. This applies equally to estimates of savings to be achieved, to estimates of time required to complete a study or install a new procedure, and to appraisals of benefits actually realized.

When the staff has earned a reputation for honesty and forthrightness, it will have gone a long way toward bringing about the second condition requisite to gaining confidence—the development of a comfortable feeling among operating personnel toward the staff and its work. But the cultivation of this feeling does not rest on integrity alone. It requires something more than trustworthiness or the assurance that one will be dealt with fairly. Here are some additional "do's" and "don't's" for the staff to observe in its effort to achieve this goal:

1. *Establish a reputation for helpfulness—not for master minding.* Procedures analysts should endeavor to create the feeling in the mind of every person with whom they come in contact that they are not developing a procedure to be handed to him as a finished package for installation, but that they are helping him to improve his operations and to think for himself. In place of making pronouncements about what the operator ought to do, they should reason out a course of action with him. They must be wary of the temptation to jump to conclusions and of the assumption that because they are specialists they must always have a ready answer for every question asked or problem raised. They will find that there is great strength in the honest admission, "I don't know" or "That's an angle I hadn't thought of." In short, the discreet staff is one whose members avoid the implication that they are experts and know all the answers. Instead, they seek to convince the operator that they know how to investigate and to analyze and that, with this knowledge, they are helping him reach sound conclusions from established facts.

2. *Save face.* Much of the operator's resentment of implied criticism can be forestalled if the analyst lets it be known that there is some understandable excuse or reasonable explanation for the unfavorable condition he encounters. This does not mean that he must manufacture excuses but simply that he must take the time to think about why something went wrong and to show his tolerance and understanding of what he finds. And in his zeal for spotting weaknesses and opportunities for improvement, he should not let himself become too casual about the strong points of the procedures he surveys. To be sure, he may be able to do nothing to improve them, but it will repay him to let others know that he recognizes their merit.

3. *Avoid the spectacular.* The analyst does not necessarily have to engineer a complete reorganization of each activity he studies to prove that he is "on his toes." The ingenuity and imagination re-

quired of him are not qualities to be exploited. His function is to develop practical, worthwhile, and acceptable improvements, not to seek spectacular changes for their own sake. He is a planner and a builder, not a pyrotechnist.

This is not written to discourage major changes or fundamentally new concepts. It is merely a plea for circumspection in approaching them. The analyst must make sure that his innovations are a better way, not just a different way, and that the measurable benefits they promise to produce will outweigh the cost and confusion of the change-over.

4. *Think vicariously.* In his approach to each study, the staff member should concern himself more with determining what is in the minds of those with whom he works than with expressing his own ideas and convictions. He should strive to place himself in the position of the other and to think about the problem at hand from that person's point of view. The more often and more skillfully he does this, the more effective he will be in energizing constructive action on his recommendations. By studying the people he works with; by observing their reactions to varying conditions and to certain influences; by learning something of their experiences, prejudices, and ambitions, the analyst will know better how to treat and deal with them to gain their confidence. By thinking in terms of their apprehensions or interests, his arguments will be vastly more meaningful and persuasive. By showing a sincere willingness to listen and learn, he will develop a reputation for tolerance and understanding that will gain him far greater acceptance than his technical proficiency.

Demonstrated results. The final key to building sound relationships with operating personnel lies in demonstrating, under actual operating conditions, the workability of procedures or methods proposals. Under some circumstances, this may be the only sure path open to the staff. This is particularly apt to be true if the staff has not already gained wide acceptance among the line organization, or if its recommendations on the study in question are regarded as radical.

Circumstances similar to these were encountered by the procedures staff of a large, long-established processing company. The management methods of this company had been slow to change over the years, and its operating executives were generally suspicious of staff work.

Operating in this climate, the company's newly organized pro-

cedures staff came to the conclusion that substantial improvements could be realized from a fundamentally different method of production planning and scheduling and inventory control. In view of operating management's rigidity, however, the staff realized that a direct, frontal attack on this problem would surely fail. Accordingly, its members got permission to work with one of the company's mill managers to "test out some refinements in the mill scheduling routine." Beginning on a modest basis, the staff gradually awakened the interest of the mill manager in trying more basic changes. By the time the far-reaching character of the staff's innovations became evident to the whole organization, the advantages of the new approach were so readily demonstrable that the other company mills began to clamor for the change.

Chapter 7

ADMINISTERING THE PROCEDURES STAFF EFFORT

The final ingredient essential to the success of the procedures improvement program is a systematic approach to directing and controlling the staff's effort. This consists of (1) determining the projects to which effort will be applied; (2) evaluating and controlling the staff's performance.

PLANNING THE PROCEDURES IMPROVEMENT PROGRAM

Up to this point, the staff's plan of operation has been considered only in its purely tactical phase—the method of attacking the individual procedures projects. But however skillful the approach employed, it cannot be fully effective unless it is applied to the areas of greatest need or opportunity. Thus, in addition to providing a sound basic approach to individual projects, the plan of operation should also include a carefully developed program of specific projects to be undertaken.

This does not mean, of course, that all projects which the procedures staff undertakes can be planned in advance or initiated by its own members. On the contrary, a substantial part of its work will always arise from conditions that could not be anticipated or will come to the staff from outside sources. Following are three of the most common origins of this kind of project:

1. Executive or supervisory requests for assistance in handling a specific procedures problem.
2. Federal, state, or local government legislation which creates new procedures requirements.
3. Changes in company policy or in the scope of its operations.

This category may include launching of new products or services; opening of new plants, warehouses, or offices; development of new channels of distribution; revision of personnel policies; and so on.

Although procedures projects arising from these sources cannot be planned in advance, the over-all program must be sufficiently flexible to permit their being handled promptly when they do arise. By their very nature, they either require immediate action or represent the special interest of a particular executive. For these reasons, the staff's effectiveness in meeting the needs of the organization is more likely to be judged on its handling of such projects than it is on the studies initiated by its own members.

The percentage of the staff's total time required by projects of this origin will vary widely between periods of change and periods of stability. However, notwithstanding the volume or immediacy of such projects, some part of the staff's effort should always be applied to its own long-range program. This is the phase of its work that, over a period of time, is likely to produce the greatest permanent benefit.

Stated simply, the objective of the planned program should be the orderly and continuous improvement of all procedures falling within the scope of the staff's responsibility. This suggests that effective program planning requires (1) sizing up the over-all job by listing all procedures encompassed by the staff's area of operation, and (2) developing techniques for spotting problems and opportunities so that priority can be given to projects that offer the greatest improvement possibilities.

Scope of the program. As a guide to the procedures staff in outlining the scope of its program, a number of typical, basic procedures have been listed below. The list is not complete for any one type of business, but it does cover a majority of the procedures common to manufacturing companies and retail stores. For other types of businesses, obvious additions and deletions would be required. Some of the processes included in the list are wholly departmental in scope; others clearly cut across departmental lines and, therefore, fall within the responsibility of a general procedures staff.

1. Development of price quotations and delivery estimates.
2. Sales-order processing, shipping, and invoicing. (The comparable procedure in retail stores involves preparation of sales checks, cash control, sales audit, and billing.)
3. Recording of receivables and cash receipts and conduct of the collections function

4. Receipt, inspection, and pricing of merchandise returns and the authorization and issuance of credit.

5. Handling of customer complaints regarding nondelivery, billing errors, etc.

6. Sales analysis and reporting.

7. Purchasing and receiving procedures, including issuance of purchase requisitions, conduct of supplier negotiations and preparation of quotation requests, issuance of purchase orders and purchase-order modifications, receipt and inspection of incoming materials, and return of rejected items. (In retail stores this process also includes merchandise marking.)

8. Accounts payable procedures, including verification and approval of invoices, approval and distribution of freight charges, recording and distribution of payables, payment of invoices, and determination of inventory unit prices.

9. Manufacturing-order procedures, including preproduction preparation of blueprints, design specifications, bills of material, and operation sheets; issuance of tool job orders, stock requisitions, and factory work orders; movement of work in process; and preparation of inspection reports.

10. Production scheduling, dispatching, expediting, and reporting.

11. Processing and control of engineering changes.

12. Material accounting and control procedures covering product materials, in-process work, and salable merchandise; manufacturing, office, and maintenance supplies; tools; packing and packaging materials; customer-furnished materials and parts; and items returned for repair. The procedural elements of this process include maintenance of inventory records; pricing and charging of material receipts and withdrawals; accounting for scrap and rework; costing of sales; control over the size, diversity, and investment in each inventory classification; physical verification of inventories; and detection and disposal of excess or obsolete items.

13. Timekeeping and payroll procedures including time recording, verification, and pricing; labor-cost distribution; payroll preparation and distribution; and maintenance of payroll records.

14. Procedures for processing changes in employment or payroll status including hirings, transfers, terminations, leaves of absence, rate changes, and reclassifications.

15. Accounting for and control of special job orders including returned-product repairs, tool and pattern jobs, research and development projects, and building or equipment repair jobs.

16. Facilities accounting and control including authorization of capital expenditures and maintenance of capital-equipment records.

The composition of this list reflects the total-procedure approach developed in Chapter 5. It reemphasizes the general principle that the procedures improvement program should be built around *processes* as the logical unit of study, rather than around jobs or organization units only. A well-balanced program, however, will always include some projects that cut across several procedures and cover a single element common to all. Projects of this type have the value of tying together and ensuring consistency in processes previously studied separately.

An example of this kind of project is the reappraisal of all operating and executive reports to make sure that collectively they fit together, with jigsaw-puzzle precision, into an integrated structure of control information. Another such study might involve the classification of all forms by function to determine whether maximum consolidation and standardization have been achieved.

A third illustration is the analysis of executive approvals required on commonly used forms as a prerequisite to action. The objective of such an inquiry would presumably be twofold: (1) to ensure that a reasoned pattern of approvals exists for each homogeneous group of company-wide activities, such as inventory, capital, and expense purchases, or personnel hirings, transfers, rate changes, and discharges; (2) to make certain that preapproval of individual action is properly related to other control devices applied to the same activity. With reference to personnel action, for example, this would mean relating preapprovals to the use of budgeted expense standards, budget reports, occupational specifications and wage ranges, and the like.

It is true, of course, that this cross-check type of study often covers much ground previously explored. But, as a kind of audit of the staff's own work, it will prove to be profitable duplication. It not only ensures that related factors are properly tied together but also serves to pick up a good many loose ends not covered by individual procedures projects.

Spotting problems and opportunities. A list of procedures delineating the scope of the staff's responsibility is essentially a statement of its long-range objectives. Within this framework, the practical phase of program planning is one of selecting and assigning priorities to projects to be undertaken during the period immediately ahead. This is not simply a matter of arbitrary selection or of lining up all

the procedures involved in some logical sequence and studying them in that order. The elements of the over-all program vary too widely in relative importance at different times to justify such methods of selection.

The job is essentially one of ensuring that that part of the staff's effort available to the pursuit of its own program is applied, at all times, to the areas where it is most needed or will produce the greatest benefit. This is a research job in itself. It means finding out, through systematic investigation and analysis, where the most promising opportunities or most serious problems lie.

There are a number of means by which evidence of procedures problems and opportunities can be quickly spotted. Following are four of the most useful:

1. *Informal contacts with executives and supervisors* will ordinarily prove to be the best source. This is simply a matter of keeping in touch with the operating problems that are bothering line personnel, and of sizing up the difficulties that they would like to have investigated and straightened out. Such contacts will usually bring to light any significant problems of interdepartmental relationships or delays in the performance of critical activities.

2. *A brief study of one or two selected performance factors* will often produce valuable supplementary clues. For example, if the procedure is one in which speed of handling is an important requirement, the preliminary appraisal might be confined to a time study of the procedural cycle. In the filling of sales orders from stock, this would simply involve determining the range of times and the average time between receipt of the order and shipment of the merchandise. Ordinarily this information can be obtained quickly at the point of completion because of the common practice of date-stamping orders upon receipt. Similar time studies might profitably be applied to the processing of requests for quotations, the handling of customer complaints or inquiries, and so on.

In procedures areas where control problems are greatest, different performance factors, of course, would have to be studied. For example, effectiveness of material control procedures might be measured by the discrepancy between actual and book inventories at the time of physical inventory taking; effectiveness of production planning and control procedures, by such factors as the range of completion times per manufacturing lot, the volume of back ordering, and so on.

Still another area worth exploratory probing is any procedure in

which many people participate. Number of personnel, by itself, is usually a fair measure of savings opportunities. Other indexes that point to possible problems are (*a*) recurring overtime, (*b*) a heavy backlog of uncompleted work, and (*c*) a rate of manpower growth substantially greater than the growth of the company as a whole.

3. *Regular operating and executive reports* are another valuable source of information for spotting procedures program targets. Important among them are budget reports showing the extent to which clerical departments conform to established expense standards. Production reports showing performance against delivery promises or the amount of idle machine time caused by lack of material may point to deficiencies in material control, production control, or procurement procedures. Narrative reports of the internal auditing staff may also uncover weak spots, particularly if that group makes periodic operating audits in addition to the traditional financial audit. Although the information contained in these and other reports will generally not be conclusive, it nevertheless will spotlight problems which will repay further investigation.

4. *Finally, analysis of customers' complaints* by type often points to possible weaknesses in procedures covering the development of delivery-promise dates, the receipt and crediting of merchandise returns, the invoicing of shipments, and the handling of customer inquiries.

It should not be inferred that the solution of problems revealed by these various means will always fall within the scope of the staff's responsibility. Frequently the cause will lie not in a faulty procedure but in poor execution or in policy deficiencies. Where this is true, responsibility for taking corrective action rests, of course, with others.

No one of these various sources is sufficient in itself to keep the staff fully informed of problems requiring its attention. But, taken together, they should provide the experienced observer with adequate means for keeping the procedures program geared to the needs of the organization.

EVALUATING AND CONTROLLING STAFF PERFORMANCE

One of the conditions peculiar to the operation of most staffs is the high degree of variability in their units of work. This is particularly true of the procedures staff. No two of its projects are alike in scope, in the conditions encountered, in the time required for completion,

or in the character of results achieved. There are no regular, daily tasks for the staff to perform, nor are its members normally subject to close supervision. Their work is essentially that of examination, diagnosis, and deliberation—all mental processes for which there are no ready standards of measurement.

For these reasons it frequently happens that little or no effective control is exercised over staff performance—either quantitatively or qualitatively. Yet, the very circumstances that make the exercise of such control difficult also increase the need for it. Without some systematic means of checking up on the entire staff's work, it is not reasonable to expect that its members will continuously put forth their best efforts or that an adequate basis will be provided for strengthening their performance.

Control should be exercised over the following three phases of the staff's operation: (1) work undertaken; (2) progress of each project (the quantitative element); and (3) results achieved (the qualitative element).

Work undertaken. The principal basis for controlling this element is the staff's master program or plan discussed earlier in this chapter. But, in addition to operating within these limits, the staff leader should satisfy himself that two other specifications are met before a new project is launched. The first is that the estimated benefits obtainable are greater than the probable cost of achieving them; the second, that the study can be undertaken without unreasonable interference with other projects currently being carried out.

The second of these controls is usually the more difficult to apply, particularly when a large part of the staff's work is requested by operating executives and supervisors. Under these circumstances there is a strong temptation to try "keeping everybody happy." But unless the staff is careful to keep from being spread too thin, it is likely to find itself buried under a multitude of in-process jobs which it never seems quite able to bring to completion.

Work progress. The basis for controlling progress on each staff assignment should be an estimate of the man-days required to complete the study. Projects likely to take more than two or three weeks should be broken down into their major steps and a time estimate prepared for each. These estimates should be made by the analyst assigned to the project and approved by the staff director before the study is begun.

Such estimates, of course, cannot always be precise. On some

studies the analyst will meet special conditions or unusual delays that could not have been anticipated. On others he may find it necessary to redefine the initial objectives or scope as the work progresses.

Notwithstanding these limitations, however, advance estimates of time requirements have many values. They force the staff analyst to plan his day-to-day work more carefully. They keep him alert by providing a bogey against which he can continuously check his own accomplishments. For the staff director, they are the means for measuring the progress of each assignment. They enable him to make more realistic promises regarding the availability of staff members to undertake new studies. Finally, they serve as the basis for his reports to the chief executive on the staff's progress and its in-process load.

The types of records and reports needed to maintain control over this element will vary considerably depending on the size of the staff. For a group of two or three members, a simple card or notebook record of in-process studies and periodic oral reports to the staff's principal should suffice.

For large staffs engaged continuously in many projects, the control problem becomes more complex. Here, various visual control devices can be used to great advantage in keeping track of staff operations and in reporting progress to others.

Figure 4 shows one type of visual device used for these purposes. This control board was developed by the general procedures director of a large manufacturing company to facilitate control of his own staff's assignments and to coordinate its work more effectively with that of several departmental procedures staffs. Two such boards were needed to list all the projects then under way in the company. To keep progress information up to date, projects of average duration were checked semiweekly and longer-range projects weekly. At the end of each month, both boards were photographed, and 10- by 14-inch photographic prints were sent to the company president as a summary report of project status.

A less elaborate but equally useful control device is the conventional Gantt chart. Figure 7 in the next chapter shows how this type of chart can be adapted to the scheduling of procedures projects and the reporting of progress.

Results achieved. The ultimate test of a staff's effectiveness lies in the comparison of its operating costs with the benefits it produces. This is not an easy test to apply. The value of improved control, closer coordination, or faster action obviously cannot be measured

in dollars and cents. Even on cost-reduction projects, savings cannot always be determined accurately.

Nevertheless, the staff director should keep some record of accomplishments on each completed study. Estimates of savings should show separately those actually realized and those claimed to be obtainable. Intangible benefits should simply be listed without any attempt at measurement.

Care must be exercised in using these records to avoid placing undue emphasis on the measurable savings achieved. In the long run, the intangible benefits of the procedures improvement program may well be the more valuable. The staff should not be encouraged to ignore these opportunities by the pressure for cost reduction.

If this caution is observed, however, these records can be of real value to the director and his superior for an occasional over-all appraisal of staff performance. In addition, the very process of evaluating and recording results at the conclusion of each study accomplishes a significant purpose: It helps to target the staff training program by calling attention to opportunities for improved performance on future projects.

Illustrative reports. As an illustration of these techniques for reporting on the staff's activities, the director of one large systems and procedures group submits to his superior a monthly report containing the following information on staff plans, activities, and accomplishments:

1. A listing of projects completed to date in the current year, showing for each project the savings and other benefits achieved. A sample of this type of report is shown in Figure 5.
2. A listing of projects currently in process and an estimate of the savings and other benefits that each is expected to produce.
3. A narrative report summarizing progress to date on each in-process project.
4. A listing of requested projects not yet started.
5. A summary of how the staff's effort has been balanced or spread among the various divisions of the company.
6. The performance factors on which the staff's over-all accomplishments are based and a summary of how the staff rates with respect to each of these factors during the current year. Figure 6 is an example of this type of report.
7. A narrative report discussing what the staff needs to do to improve its rating as reflected in the performance report illustrated in Figure 6.

Fig. 4. Procedures Project Control Board

N Indicates Recent Project — Dec. 19, 1958 — Board No. 1

Ref No.	Priority	Start Date	Project	Participating Personnel: Staff Symbol	Names	Crew	Org No.	Names	Crew	Progress: Survey Finished	Plans Outlined	Proposal Prepared	Approval Obtained	Installed	S P I 's or Write-ups Prepared	Location of Activity	Sched. Finish Date	Remarks	Date of Last Check
1	★	5/2	Salvage and Reclamation—Collection & sale of scrap & determination, collection and disposal of surplus and obsolete materials	O O	J A McLean F P Caruthers		1692 1650	H Rotert T Archbold, Sr		7/27	8/13	8/23	9/10	10/13	In process	C	11/15 1/10	Inv red	28
2		11/22	Raw Material Control, Tabulating Application—Analysis and summarization of material requisitions and preparation of purchase requisitions	O	R. D. Shaver		1645 1646	T J Gill Allen Moe		12/2	12/16	Not required	Not required	In process		C N	1/31	Project consists of several parts	27
3		11/26	Shipping Orders to Vendors and Customers—Preparation, handling and routing of all forms	O	H Wilson					12/18	In process					C	2/10		24
4		6/1	Priority Nos for Mfg Lots—Marking lots to show relative urgency thru mfg processes				4670	J Drury		Not required	6/25	Not required	9/13	10/20	In process	N	12/31		27
5		6/1	Control and Handling of Ball Bearings—Central stores—mfg techniques—loss factors—inspection	M	W A Hickox					6/10	7/10	7/27	In process			C N	9/25 1/2	Inv red	27
6		6/4	Vendor Rework—Determination and authorization to rework—preparation, handling and routing of rework order form 2907	O A	D W Powers H Robinson		1154 1330	A G Nicholson R E Robertson		6/10	6/17	6/29 9/20	11/23	In process	In process	C S B N R E	11/25	Proposal revised	22
7		7/7	Flow of Work in Mfg Eng Depts —To determine best procedures for improved operation of these depts	M	L. E Waldeck					7/21	In process					C	11/20 1/30	Further development pending completion of project 10	27
8		4/20	Absence and Lateness—(Hourly Employees)—Procedures to reduce hours lost	O A	J L. Barton F H Boss		1126	S Hall		5/8	5/10 9/8	5/26 9/15	6/15 9/15	7/6 9/25	8/15 9/28	B S R E N	8/15 10/25	Installation to proceed 1/3 Completed	27
9	★	5/10	Establishing Tabulating Mfg Information Section—Bills of Material—C M P reports—operation sheet files—work books	O	R D Shaver		1645	T J Gill		6/7	6/20	7/10	7/12	In process	In process	C N	12/15 1/15		27
10	★	7/19	Transfer of Tool Control—Location & responsibility from production control to mfg eng	M M	L E Waldeck G Adams	5				8/14	Not required	Not required	Not required	9/27	In process	S N E B	1/30	Installation to proceed 1/2	27
11		6/15	Employee Recreational Activities—Determination of support and subsidy for certain activities				1120 1100	H L Harter T W Keesee		7/20	7/31	In process				C	10/15 11/30		24
12		7/12	Misc Maintenance Spare Parts—Tabulating procedure, stock records for contract stores dept	O A	G Willard J L. Griggs		1782 1923	J Chamberlain J Banbury		8/2	8/11	8/12	9/28	In process		C	9/1 1/3		28
13		7/12	Misc Maintenance Spare Parts—Setting up all plant depots and tabulating procedures for same	O	G Willard		1782	J Chamberlain		7/28	7/31	8/12	8/24	In process		S N	12/1 2/1		28
14	★ Completed	7/17	Misc Maintenance Spare Parts—Establishing status of unfilled customer orders and inventory for contracts stores dept	O	G Willard	3	1782	J. Chamberlain	3	8/4	8/11	8/12	8/12	12/15	Not required	C	12/1 1/3		12/15
15	Completed	6/5	Retroactive Wage Adjustment—Plans and procedures for payment	A I	J L. Griggs E Timulty					8/5	8/16	8/31	9/11	10/24	12/20	C	→	Final award approved 12/3	12/20
16		11/26	Transfer of Employees—Revision of existing procedures for proper personnel records, timekeeping & accounting control	O I	E A. Pegram E A. Timulty					12/3	12/10	In process				C	1/31		28

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
17		11/10	Controlled Release of Material to Machining—By means of a route card & travelers, as machine assignments				2650	R. Wolf	2	11/17	11/24	Not required	Not required	In process	In process	S	12/31		27
18	★	10/21	New Operation Sheet Procedure—Revision of existing operation sheets, "O" sheet data and current tool status	M M M	W. Miller W Miller G W Pritbladdo	12 2 2				11/1	11/8	Not required	Not required	In process In process In process		S B N	2/20		27
19		9/27	Accounts Payable—Review and improvement of existing procedures	O O	B. Robichaud R. H Hinck					10/25	11/1	11/8	12/1	In process		C S B N	2/1	Project consists of several parts	27
20		8/2	Analysis of Organization, Functions & Complements of Personnel—Industrial relations dept.	C C	Tyler Davis J C Olsen					9/20	10/20	11/30	12/15	In process		C	10/15 1/25		24
21		9/1	Control of Operating Supplies—Establishing stock rooms, purchase ordering points, & analysing withdrawals by responsibilities				1402	R. C. Mervine		9/5	10/28	11/6	11/12	In process		C	12/1 12/30	Inv. red	24
22		1/2	Sales & Cost of Sales Records—Transferred from manual operation to tabulating	A	J L. Griggs		1930	E O Swedin		3/25	4/12	4/26	5/2	10/30	In process	C	12/1 2/1		24
23	★	6/6	Control of Inventory, Machining Depots—Packaging & rearrangement of stock, establishing perpetual inventory records				4656 4675	K. Seal A. Sheppard	15	6/10	6/15	Not required	6/20	In process		N 10 machining depots	12/1 12/31	Inv red	24
24	★	4/9	Control of Inventory, Assy. Depots—Packaging and rearrangement of stock, establishing perpetual inventory records	P	L. Jackson	4	4675	J Ford		4/20	5/4	5/9	5/9	In process		N 5 assy. depots	12/1 12/31	Inv red	24
25		5/1	Parts Control Cards—Establishing procedures for recording parts required, ordered, received and disbursed from assy depots				4675 4675	V Koch M. Cordovano		Not required	5/20	5/25	5/25	In process		N	12/1 12/31	Inv red	24
26		8/2	Control of Inventory, Training of Personnel—In machining and assy. depot stock rooms	P	M Mackelduff					8/6	Not required	Not required	Not required	In process		N	12/1 12/31	Inv red	24
27		6/1	Machine Tool Accessories & Attachments—Establishing inventory and control	M	F. Smith	20 15 12				6/17	7/25	7/27	7/30	In process In process In process		C N B S	11/20 3/1	Inv red	24
28		11/10	Interplant Orders and Transfers—Procedures for proper control of work done by one plant for another	P	J. Merrifelder					11/20	11/28	In process				C	1/3	Project consists of several parts	28
29		10/15	Machine Activity & Efficiency Reports—To establish the proper reporting system required by plant management, gen'l management and pricing and estimating	O	D W. Powers					11/24	In process					C S B N	11/30 1/15	Held, pending tabulating application	24
30		9/25	Establishing Payroll Tabulating Procedures—Hourly and class II employees	O	B. Robichaud		2923	B A. McCarty		10/1	10/15	Not required	10/15	In process		S	2/2		24
31	Completed	9/25	Packaging, Processing & Testing—Methods and materials used for handling and shipping product parts	M O	H. P McDermott R. Hinck		1620	J. E. Eckersley		10/9	10/15	10/28	12/2	12/10	12/16	C	12/15		12/16
32		2/1	Accounts Receivable—Transferred from manual to bookkeeping machine operation				1930	E. O Swedin		3/25	4/12	4/26	5/2	10/30	In process	C	12/1 2/1		24
33		11/15	Expense Budget—Tabulating comparative monthly departmental expense and budget statements	O	G. Willard		3923 3923	W. J Patterson A. L. McGrath		11/17	11/17	Not required	Not required	In process	In process	B	12/30		28
34		7/10	Direct Labor Forecast—Determine productivity requirements	O	P. Beyer		1903	R. Bayless		6/5	9/1	Not required	Not required	In process		C	12/15 1/15		28
35	★	8/5	Establish Plant Ratios for Indirect Personnel—Budget and over-all-expense reduction	O	P. Beyer		1903 3921	E. J. Powell A. Fishman		9/4	9/10	9/10	9/15	In process	Not required	B	12/30		28

Fig. 5. Monthly Report on Completed Systems and Procedures Projects

SYSTEMS AND PROCEDURES DEPARTMENT SUMMARY OF PROJECTS COMPLETED THIS MONTH

MONTH ENDING_____

PROJECT NUMBER	PROJECT DESCRIPTION	SAVINGS			IMPROVEMENTS MADE IN THE AREA OF:					
		REALIZED			ORGANIZATION					
		ONE-TIME	ANNUALLY RECURRING	ADDITIONAL POTENTIAL	STRUCTURE	RELATION-SHIPS	MANAGE-MENT PLANNING	MANAGE-MENT CONTROL	CUSTOMER SERVICE	EMPLOYEE RELATIONS
1	Examine order-filling procedures to identify potentials for improvement in customer service and reduction of clerical costs.		$72,000		Major	Moderate			Moderate	
3	Develop corporate capital appropriation policies and procedures.						Major	Major		
7	Study purchasing department to identify opportunities for employing value analysis techniques and for improving vendor delivery performance.		*(Estimated to be substantial, but not measurable)*		Major	Major				
10	Evaluate_____ Company's proposal for installation of_____ payroll machine in West Coast plant.			$17,000				Moderate		

Fig. 6. Summary of Systems and Procedures Staff Performance

SYSTEMS AND PROCEDURES DEPARTMENT
Performance Report — 1959

PERFORMANCE REQUIREMENTS AND STANDARDS	POINT VALUES FOR STANDARD PERFORMANCE	ACTUAL PERFORMANCE (POINTS ATTAINED EACH MONTH FOR THE YEAR TO DATE) JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1. 70 percent of completed projects should be "major" in the sense that they result in significant savings or substantial improvement of management planning and control, customer service, etc.	25	30											
2. 80 percent of in-process projects should be "major" as defined in #1 above.	20	11											
3. 100 percent of completed and in-process projects must be "on schedule".	15	9											
4. Tangible dollar savings should equal 300 percent of the Systems and Procedures Department's budgeted expenditures.	10	56											
5. 100 percent of completed projects should result in excellent relationships with departments served.	10	8											
6. 100 percent of unassigned projects should be scheduled for commencement within thirty days.	10	10											
7. 70 percent of completed and in-process projects should be performed for departments other than Finance Division.	5	3											
8. 100 percent of required Systems and Procedures policies should be developed and issued in the Management Guide.	5	0											
Total	100	127*											

**It is more important to reach "standard" on each and every requirement than to excell in "total points". Significant variations from "standard" are discussed in the narrative report that follows.*

Part Three

PROCEDURES ANALYSIS AND IMPROVEMENT TECHNIQUES

Chapter 8

INITIATING A PROCEDURES PROJECT

The results achieved from any given procedures project can be heavily influenced by the kind of a beginning that is made—by the care that the staff takes to lay the proper groundwork before starting active work on the study itself. If the preparatory effort is thorough and painstaking, it will be reflected in the certainty, dispatch, and penetration with which the study is conducted and in the cooperation which is given by operating personnel. If it is casual or superficial, there is likely to be much floundering and misapplied effort by the staff as well as inadequate understanding by those whom the study affects. This may seem obvious. Yet it is surprising how often a staff will plunge into a new assignment without taking the time to think it through carefully or to create an atmosphere favorable to its performance.

The first two steps in a procedures study should, therefore, be devoted to planning the project in detail and to paving the way with the operating personnel concerned. Most staffs will profit from an objective analysis of the amount of attention they are accustomed to giving these factors. They will generally find that they are far from reaching the point of diminishing returns—that increased time and thought spent on these initial steps will be repaid severalfold in faster, more effective performance and in a higher percentage of recommendations acted upon favorably.

PROJECT PLANNING

Planning is no more than "charting your course before you begin." It is far easier to plan, follow a plan, and modify it if necessary, than to start by "riding off in all directions" and to conclude by working under considerable pressure long after the study could have been

completed smoothly and with the assurance that no important point had been overlooked.

The characteristics of a good project plan are that it specifies clearly (1) what is to be done, (2) how it is to be done, (3) who will do it, and (4) when it is to be done.

Before each of these elements is considered, it should be brought out that development of a detailed plan will often require a brief exploratory survey aimed at acquiring background information about the problem or activity to be studied. Ordinarily this can be accomplished quickly and satisfactorily by conferring with a few key executives and supervisors, including some who are actually engaged in the activity and others directly affected by it. The objectives of these conferences should be threefold: (1) to determine the symptoms and possible causes of difficulties or to discover major improvement opportunities; (2) to evaluate the size of the job that lies ahead; and (3) to make an initial appraisal of the attitudes of operating personnel toward the study.

The process of acquiring this background is mainly one of asking intelligent questions about the operating experiences and problems of the persons interviewed—their understanding of the specific problem at hand; the nature and objectives of the major functions performed; the volume of work and number of employees involved; factors affecting the volume, irregularity, complexity, or quality of the work; and so on. Depending, of course, on the scope of the activity to be studied, the time required for this initial survey might range from a few hours to as many days. But any reasonable amount of time spent in this pursuit will be soundly invested, for, without it, development of a worthwhile project plan is scarcely possible.

Determining what is to be done. When a procedures study is undertaken because of something that went wrong or was requested by someone outside the staff, the first step in planning the project is that of thinking through the real problem. This is a matter of distinguishing between symptoms and causes and of determining whether the conditions that precipitated the study reflect the whole problem or just a segment of it.

The procedures staff in a large machinery manufacturing company operating several plants was assigned the task of streamlining the company's procedures covering personnel hirings and transfers. The complaint of those who requested the study was that the time-consuming paper work involved in these processes had given rise to two types of problems: (1) serious delays were experienced in hiring

new employees; (2) employee grievances arose frequently because of failure to pay transferred employees promptly at their new location. The second problem developed because payroll records were not changed until all the prescribed approving signatures had been obtained on the transfer authorization form; the employee, however, was usually transferred as soon as the form had been filled out by the supervisor requesting the transfer.

In light of this initial definition of the problem, the staff's specific assignment was to cut in half the time required to process these forms by developing recommendations for speeding up their routing, review, and approval. A number of suggestions were made by the executives and supervisors who initiated the study. One was that extra copies of each form be prepared so that approving signatures could be obtained concurrently rather than consecutively. Another was that "Urgent" stickers be attached to the forms and that no person be allowed to hold the form more than four hours. Finally, it was suggested that the staff look into the "pros" and "cons" of prohibiting employee transfers until all prescribed approvals had been obtained.

The staff's exploratory survey disclosed that the company's written instructions governing these activities specified as many as four approvals requisite to the hiring of a new employee and as many as five on a transfer—two in the line of authority *from* which the employee was to be transferred and three in that *to* which he was to be transferred. In addition to these approvals having official sanction, more than one divisional executive had informed his subordinates that he wished to approve all personnel additions within his line of authority. In large divisions, this often had the effect of adding to the list of approving signatures already prescribed. Thus, in actual practice, the pattern of approvals had been built up by superimposition rather than reduced by delegation.

In digging into the reasons for this cumbersome control mechanism, the staff discovered that although a system of departmental budgets had been in effect for some years, summary reports of actual performance were not being used effectively to control operating results—including the item of manpower expense, which was of immediate concern. Budget reports had fallen into disuse because they were seldom available before the twenty-fifth of the month following that covered by the report. And even when they became available, their use was discouraged by the poor arrangement of data and the sheer volume of information reported. As an alternative, therefore, key executives sought to obtain control over manpower expense by

their preapproval of individual actions—which, in effect, forced them to labor as their own statisticians.

From this preliminary review it became evident to the staff that both the delay in obtaining final decisions on hirings as well as the large number of grievances arising out of employee transfers were merely symptomatic. Nor was the real problem that of finding ways to speed up these activities. The real problem was twofold: (1) to increase the timeliness and utility of operating reports as a control device; (2) to recognize that preapprovals are but one type of control that must be evaluated in relation to all other types so that a simple but highly integrated control structure could be evolved.

This illustration shows that the isolation and definition of basic problems are, perhaps, of greater consequence than all the other thinking in which the procedures staff must engage. They are, by themselves, creative acts, for they open the way to fundamental and relatively permanent solutions as opposed to expedient patching up of weak spots.

Project Planning in the Staff-initiated Study. When the staff itself initiates a study aimed at appraising an existing procedure and discovering improvement opportunities, there is, of course, no problem to define. Here the initial step in project planning becomes that of defining the objectives of the study. This is essentially a matter of predetermining what is to be accomplished—of thinking through the results to be expected and the form the completed study will take.

If this statement of objectives is to be a useful guide in developing the remaining elements of the project plan, care must be taken to ensure that it is sufficiently specific. For example, if the activity to be analyzed has an important bearing on the quality of service rendered to customers, it is not enough merely to state that the objective is to improve customer service. The analyst must think through exactly *how* customer service is affected and state his objectives in those terms. Thus, in effect, he breaks down the general objective into its component parts, each of which points to a specific subactivity requiring detailed study.

This type of breakdown is illustrated in the following statement developed in connection with the planning of major changes in the accounting system of a Middle Western manufacturing company. At one time the activities of this company were almost entirely confined to the job-lot machining of detailed parts for companies engaged in the assembly of finished items. A few years

ago the company developed its own line of finished products which since have become an increasingly large part of its business. The statement that follows represents one of several projects undertaken during this period to adapt company procedures to the requirements of a different type of manufacture.

The general objective of this study is to provide the basis for more effective control of manufacturing progress and costs by developing procedures for collecting accurate cost, time, and quantity data applicable to each manufacturing operation at all plants.

Specifically the project is designed to accomplish all or as many of the following subsidiary objectives as prove to be worth while:

I. With reference to the Manufacturing Division:
   A. To supply data for:
      1. Machine activity reports covering productive operations and rework as well as nonproductive operations and tool making.
      2. Development of allowed times.
      3. Adjusting machine-load schedules.
      4. Reporting production progress.
   B. To facilitate the analysis of scrap and rework.

II. With reference to Accounting:
   A. To develop operation cost data for estimating purposes.
   B. To provide the basis for checking attendance hours against labor-cost-card hours.
   C. To facilitate the accounting distribution of labor.
   D. To supply data for:
      1. Determining actual cost of scrap and rework.
      2. Achieving tighter control over work-in-process inventories.

Unless the objectives of each undertaking are defined with some such precision as this, the study is likely to be characterized by confusion, waste motion, and random pursuit of whatever fancied opportunities happen to capture the analyst's attention. A secondary benefit is that a clear statement of what one is trying to accomplish will generally prevent the launching of projects that should never have been undertaken at all. Particularly where the study is aimed at achieving measurable gains, the range of probable savings can usually be estimated with reasonable accuracy in advance. Where this is possible, a realistic comparison of savings estimates with the probable cost of carrying out the project will forestall unprofitable ventures and provide a rough standard for measuring performance on those undertaken.

Planning how to do it. With the desired end result clearly established, project planning proceeds with a determination of the specific

action steps necessary to reach that goal. This part of the preparatory work should cover the following three factors:

1. *Areas to Be Covered.* This element of the project plan should be expressed in terms both of functions and of organization groups or positions involved. Where several operating units of the business are engaged in the activity under consideration—as, for example, in a chain of retail stores—the analyst should determine which unit will be studied and which will be used later for a trial installation of the procedures developed.

2. *Facts to Be Gathered.* Next, the analyst should determine and list for each stated objective, or each phase of the defined problem, all information, statistical data, and viewpoints required to arrive at sound conclusions and recommendations. This statement of the facts to be obtained should also outline the specific elements of work to be analyzed within the prescribed area. That is, the analyst should determine in advance whether the objectives of the study can be achieved by limiting the analysis to procedures, clerical methods, forms, records, and reports, or whether he should also cover policies, organization structure, personnel, facilities, and layout of the work area. Finally, he should decide how each set of facts is to be obtained —that is, whether by interviewing supervisors and workers, by relying on existing operating statistics, by making an actual audit of the work, by requesting operating personnel to accumulate certain data, or by some other means.

These first two factors in the plan of action have the effect of defining the scope and limitations of the project. Even with a clear statement of problems and objectives, procedures studies have a tendency to spread out and cover more ground than necessary unless their scope is first delineated in terms such as these. In addition, the specific listing of work elements to be covered will permit the analyst to reach a clearer understanding and agreement with operating department heads regarding the extent of the study.

3. *Strategy in Conducting the Study.* Finally, the "how-to-do-it" part of the project should make specific provision for gaining the understanding, acceptance, and participation of operating personnel. This is simply a conscious application of the principles of staff-line relationship at the time each individual project is undertaken. The need for more careful advance planning of this element is ably expressed by Wiren and Heyel in the following statement: [1]

[1] Alexis R. Wiren, and Carl Heyel, *Practical Management Research,* 1st ed., McGraw-Hill Book Company, Inc., New York, 1945, pp. 144–145.

The human-relations part of the problem is never simple. . . . The paradox is that the exact reverse is usually the *apparent* condition; determination of the best method seems difficult, and the human-relations phase of the solution is usually not considered worth special study when the plans are laid.

Assigning responsibility and scheduling the project. Ordinarily a procedures project consists of the following major parts:

1. Making arrangements with line personnel.
2. Gathering and verifying the facts.
3. Analyzing the facts and developing conclusions and recommendations. (This step may include preparing initial drafts of project reports, proposed forms, procedure flow charts or instructions, etc.)
4. Obtaining approval of recommendations.
5. Installing new procedures and eliminating those to be replaced.
6. Following up the installation to incorporate revisions and improvements developed during the change-over.

On small projects, a single staff member would ordinarily carry out all phases of the study. On large projects, however, even some of the major elements listed above might be subdivided and distributed among a team composed of staff and line personnel. This is most likely to be true of the fact-gathering process, which often is readily separable into distinct and sizable segments. In any event, the project plan should clearly state who is responsible for each identifiable part of the study and how much time each of these assignments is estimated to require.

Project planning forms. Procedures staffs will generally find it useful to adopt some kind of standard form to be followed in drawing up project plans. By establishing a framework of information required, such a device tends to ensure greater uniformity and completeness in the plans developed. In addition, the requirement that plans be reduced to writing will force staff members to be somewhat more diligent and circumspect about this matter than they might otherwise be. Finally, the value of a written commitment as an incentive to the analyst and a basis for control by the leader has already been considered.

The form used by one procedures staff for this purpose is reproduced in Figure 7. Its five sheets have been filled out with a hypothetical project plan to show how they can be adapted to the type of definition that has been recommended. Of particular interest is the fourth sheet showing the use of a Gantt chart for scheduling the various steps of the project. As the project is carried out, red lines

Project title General Survey of Order Processing and Invoicing Procedures

Project No. _____
(To be assigned when approved)

Requested or initiated by G. A. Hansen **Date** January 5, 1959

PROJECT PERSONNEL

A. M. Fuller—project leader
W. G. McBride
L. R. Carroll—central order department

PROJECT OBJECTIVES

1. *Cost Reduction.*
   a. To reduce time required of salesmen in preparing order forms.
   b. To reduce clerical expense of order processing and invoicing.
   c. To minimize idle time in stock and shipping rooms resulting from irregular flow of orders.
2. *Improvement in Customer Service.*
   a. To speed up the filling of sales orders by accelerating the procedure cycle and by facilitating stock picking.
   b. To increase the speed, accuracy, and completeness of order-status information supplied to customers.
   c. To increase the accuracy of stock picking.
3. *Improvement in Controls.* To increase the timeliness and completeness of order-summary data supplied to various operating departments.

ANTICIPATED RESULTS

The present clerical force engaged in order processing and invoicing at the branch sales offices, main office, and plants totals 73 persons. It is estimated that a 10 per cent reduction in personnel requirements, or an annual payroll saving of about $35,000, can be achieved through procedures simplification and methods improvements.

In addition, a substantial reduction appears possible in the 1,100 hours of idle time that occurred in the stock and shipping rooms during the past six months because of the irregular flow of orders.

No attempt has been made to evaluate possible intangible benefits in the form of improved customer service or more useful order-summary data. A preliminary survey indicates, however, that a number of worthwhile improvement opportunities exist in these two areas.

SCOPE OF PROJECT

1. *Accelerating Procedure Cycle and Reducing Clerical Expense.* Flow of a sales order from the time it is prepared by field salesman until shipment has been made and invoiced.

Fig. 7. Hypothetical Procedures Project Plan

a. Areas to be covered:
  (1) Field salesmen (three working out of New York branch).
  (2) Branch sales office (New York).
  (3) Order department.
  (4) Credit department.
  (5) Stock room (Ashton plant).
  (6) Shipping department (Ashton plant).
  (7) Billing department.

b. Elements to be covered:
  (1) Sales-order policies.
  (2) Clerical operations, methods, and equipment.
  (3) Forms used, records maintained, reports prepared.
  (4) Volume and irregularities in flow of work.
  (5) Length of procedure cycle.
  (6) Communication costs in order handling.
  (7) Interdepartmental operating problems.

2. *Simplifying Order Preparation by Field Salesmen.*
  a. Discuss order-preparation problems with New York branch manager and three salesmen.
  b. Explore possibility of printing product names on order form.
3. *Improving Order-information Service to Customers.*
  a. Organization considerations:
    (1) Determine extent to which order department and plant stock rooms have direct contact with customers regarding orders and shipments.
    (2) Determine extent to which salesmen communicate directly with plant stock rooms to expedite shipments.
    (3) Determine relationships between order department and sales division in establishing priority of shipments.
  b. Analyze sample of 50 customer order-status inquiries to determine time taken to reply and completeness of information given.
  c. Determine extent to which unsolicited information regarding shipment delays is supplied to customers.
4. *Facilitating Stock Picking and Reducing Idle Time.*
  a. Determine extent to which arrangement of commodities on shipping-order form varies from arrangement of items on stock shelves.
  b. Analyze flow of orders to stock room by one-hour intervals for period of one week.
  c. Determine reasons for irregularities in order flow.
5. *Improving Order-summary Control Data.*
  a. Ascertain order-summary information requirements of sales, production, and merchandising departments.
  b. Determine present availability of required data, both as to completeness and timeliness.

Fig. 7. Hypothetical Procedures Project Plan (cont.)

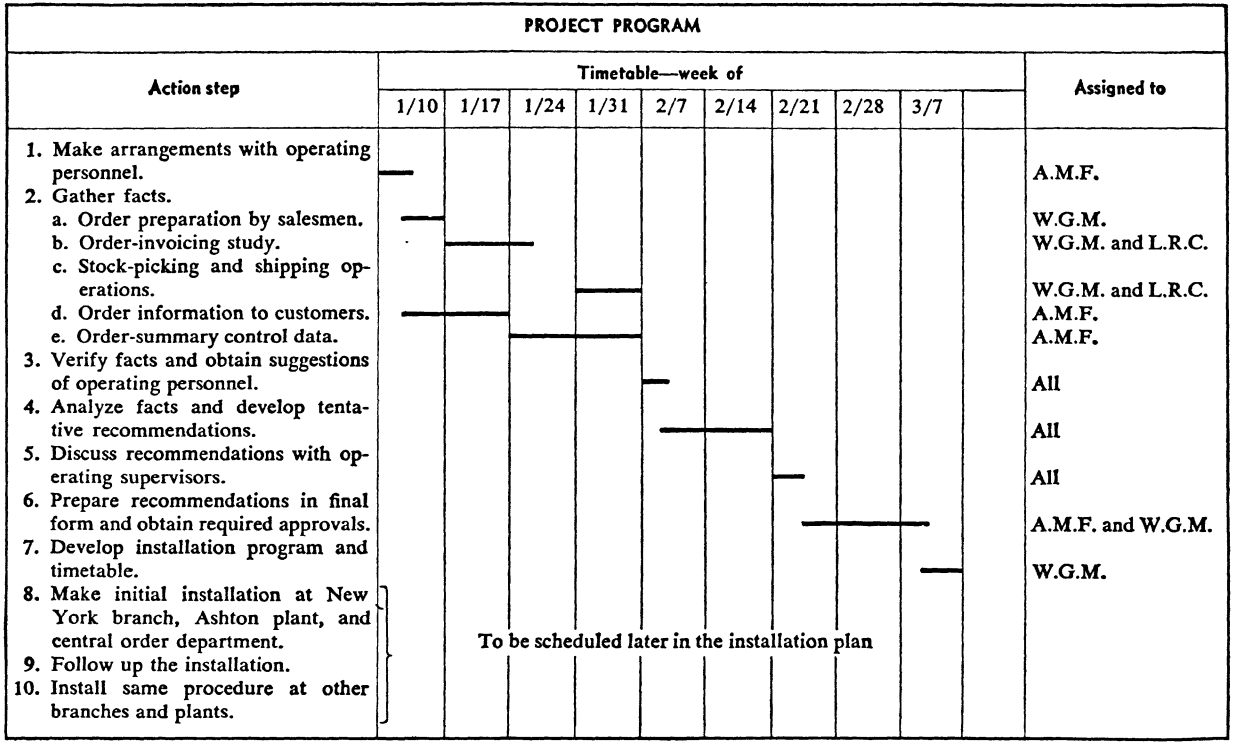


Fig. 7. Hypothetical Procedures Project Plan (cont.)

PROJECT APPROVAL

Project approved by — Date

PROGRESS COMMENTS

COMPLETION REPORT

Date project recommendations approved	Date trial installation completed	Date final installation completed

Summary of benefits realized

Fig. 7. Hypothetical Procedures Project Plan (cont.)

indicating actual progress are drawn on this sheet above the black schedule lines appearing in the chart. These data are not only the principal control tool of the staff leader, but they also serve as a monthly progress report to his superior. For purposes of this report, a vertical line is drawn on the schedule sheet through the point indicating the date of the report. In this way the chief executive is provided with a convenient visual representation of progress achieved against the original plan. Where necessary, the staff leader also includes a brief narrative report on the last sheet of the form under the caption "Progress Comments."

PAVING THE WAY

The steps involved in laying the proper groundwork with operating personnel will vary widely, of course, depending on the origin and importance of the project. At one extreme in the range of variation are projects that operating executives request the staff to undertake. Here the initial requirements for developing confidence are generally satisfied by the staff's reaching agreement with the executive on the nature of the basic problem and obtaining his approval of the plan for tackling it. At the other extreme are the projects of major significance which the staff itself initiates. On these the task of kindling interest and support is more demanding. For that reason, the latter type of project has been selected to illustrate some of the steps to be taken in the process of paving the way. Details on other types of projects would have to be modified, of course, to fit individual situations.

Securing executives' support. The staff should make its beginning by discussing the project openly with the head of each major organization unit affected. These are the division and department heads who ordinarily will not take direct part in the study, but whose attitudes with respect to it will be reflected by their subordinates with whom the staff works. Here are some pointers for the staff to follow in carrying on these discussions:

1. *Give each executive the full background of the study.* Explain its purpose, the reasons behind it, and the results that are expected. Emphasize the benefits most likely to interest him. If the anticipated benefits will not affect his operations directly, stress the interdepartmental implications of the project so that he can see how the cooperation of his unit is required to solve a problem which makes itself evident in another area.

2. *Forestall a defensive attitude.* If the executive is likely to feel even remotely responsible for the unsatisfactory conditions that the project is aimed at correcting, offer a reasonable explanation for those conditions early enough in the discussion to forestall any implication of criticism.

Under circumstances similar to these, the author once heard a procedures staff director offer the following explanation to an operating executive, with completely disarming effect:

> During the past few years everyone has been so busy worrying about more pressing and immediate problems that there hasn't been much time left to keep an eye on our operating methods and procedures. The result has been that a good many of them have become complicated and unwieldy, and a few have broken down altogether.
>
> It's easy to understand how this came about. Take, for example, the particular procedure we've been discussing. When it was originally designed, it was quite simple and exactly suited to the requirements. But, over a period of years, new operating personnel and new conditions have brought a good many changes and additions to the original structure. Most of these were not important enough individually to stir up any great excitement at the time or to give rise to much thought about how they fitted into the over-all plan. But taken together, they have had a substantial, cumulative effect on the scope of this activity, on its importance to the internal operation of the business, on the number of people it involves, and so on.
>
> And so, just as the company takes a periodical physical inventory, we would like to work jointly with you and the other department heads concerned to take stock of this procedure—to ensure that it's the simplest and most efficient way of meeting present requirements.
>
> Your operating people probably have a good many worthwhile ideas in the backs of their minds on ways to short-cut and improve existing operations. They've probably had them for some time but just haven't had a chance to do anything about them. As we see it, one of our principal functions in working with these people is to crystallize their ideas and see that the best use is made of them.
>
> We assure you that we don't want to move too fast or abandon any necessary controls. And, as the study progresses, we'd like to discuss it with you and get your approval on any ideas affecting your operations before they're discussed with others.

3. *Review the project program with each executive.* By reaching advance agreement with key personnel on the steps in the program, the analyst avoids a later risk of having the results of his study dis-

credited through criticism of the method by which it was carried out. And, here again, the analyst has an opportunity to establish rapport by taking others into his confidence. By laying a carefully developed plan of action in front of them, he builds assurance that he knows his job and how to go at it. It is also true that most executives like the feeling of being consulted—of being asked for their ideas and their approval of the program. Finally, the executive can often save the staff considerable time by offering helpful suggestions regarding sources of desired information.

4. *Request the executive's assistance.* If the project is comprehensive in nature, it is desirable to formalize operator participation by asking the executive to designate one of his subordinates to work actively with the staff analyst during the survey and design stages. Where less formal participation is required, the concurrence of the department head should be obtained on any specific data to be accumulated by his group in connection with the study. He should also be told to what extent the assistance asked of his personnel will affect the department's regular, daily work. Finally, the help of the executive should be sought in laying the groundwork for the project with front-line supervisors and workers. He and the analyst should decide whether or not any formal explanation of the reasons for the study need to be given to the persons with whom the analyst will work, and, if so, what that explanation should be and who should make it. Where operators are called together as a group for this purpose, it is preferable that the executive himself make the explanation in order to erase any doubt about his support of the project. The analyst, in his later contacts with individual supervisors and workers, will have adequate opportunity to amplify the executive's earlier explanation in whatever way seems necessary.

Securing the support of supervisors and workers. If by these steps the analyst succeeds in gaining the initial support of the executives whose operations are to be studied, he must not make the mistake of assuming that the attitudes of supervisors and workers are any less important. In short, he must do the same sort of a job to arouse their interest and support as he has done with their superiors. This often requires even more careful planning and skillful execution than were necessary at the executive level, since the interests and habits of the workers and their immediate leader are so much more in jeopardy.

In all probability, the factor that exerts the greatest influence on operator attitudes is their understanding of the purpose behind

the study. It may not always seem wise, of course, to tell them all the objectives sought, and there is an understandable reluctance to do so when the principal goal is to reduce operating costs. But the analyst must remember that the real purpose of such an undertaking cannot be concealed very long from most workers, and, therefore, a frank acknowledgment of intent may be infinitely less harmful to morale than rumor, suspicion, and uncertainty.

One company which undertook a cost-reduction study of all its overhead activities assured its employees in advance that any reduced manpower requirements resulting from the project would be translated into actual savings through normal personnel turnover and transfer, rather than through layoffs. The departments affected employed some 250 people, and the jobs of 40 were eliminated by the study. The full amount of this saving was realized within eight months after completion of the study without a single layoff and with incalculable benefit to morale throughout the organization.

Such assurances cannot always be given, of course, but they can be given much more often than they are even thought of.

Finally, in his initial contact with supervisors and workers, the analyst must also begin to make them aware of his desire to solve problems or develop improvements *with* them and not *for* them. He should make it clear that their knowledge and ideas are essential to achieving the most profitable results and that they will receive full credit for their contributions.

Chapter 9

GATHERING THE FACTS

An executive of a large style-goods manufacturer summed up one of his company's basic operating procedures in these words: "We've been trying to straighten out and simplify this activity for years without much success. Our biggest stumbling block is that the procedure cuts across so many departments and has become so complicated that probably not more than one or two people in the whole organization understand it completely."

Later investigation showed that even he had overestimated the knowledge of his personnel about the routine in question. A few front-line supervisors knew what actually took place within a major segment of the procedure, but no single individual understood it wholly. In addition, the information that did exist was tainted by a good deal of supposition and misconception. Parts of the routine were being performed quite differently from the way supervisors thought they were being done or from the way written job instructions said they should be done. Erroneous ideas on the causes of difficulty and delay had been voiced so freely that the whole clerical force had tacitly come to accept them. In short, no one had all the *facts* essential to an intelligent analysis or improvement of the procedure.

These circumstances highlight the importance of systematic fact finding as the first step in the execution of a procedures project. This is the same fundamental research process that underlies the orderly solution of any business problem. Its importance does not vary with the type of project undertaken. Development of an entirely new procedure requires knowledge of the objectives to be met and the resources available to meet them. Improvement of an existing procedure requires thorough understanding of its purpose, its detailed operations, and the conditions affecting its performance. Both require

patience and resourcefulness to ensure that the information gathered is complete, and diligence to ensure that it is accurate.

The purposes of this chapter are to:

1. Provide a check list of the types of information to be gathered in procedures studies.
2. Point out some of the common pitfalls that stand in the way of getting complete and accurate information.
3. Show how the essential facts can be recorded in a way that will reveal significant relationships and facilitate analysis.
4. Suggest some useful pointers on how to conduct the survey.

THE INFORMATION TO BE GATHERED

The previous chapter stated that the factual and opinion evidence to be obtained on any given project should be governed by the defined objectives of that study. An obvious corollary, of course, is that not all of the various types of information outlined in this chapter are applicable to every project. For example, a study aimed at strengthening operating controls would ordinarily involve the gathering of facts somewhat different from those required to accelerate a procedure cycle. The same may be said of solving a specific procedure problem in contrast to making an over-all appraisal of a given process for the purpose of uncovering improvement opportunities of all types.

Within the framework of this limitation in the scope of specific projects, procedures research is concerned with the following classes of information:

1. Objectives and requirements to be met.
2. Organization and personnel.
3. Policies.
4. Details of existing procedure.
5. Cost factors.
6. Effectiveness of the procedure.
7. External conditions.

Before each of these types of information is considered, it should be pointed out that frequently some part of the data required will already be available and, therefore, will not need to be gathered during the formal survey phase of project execution. This applies, for example, to any facts gathered during the initial exploratory study

forming a part of the project planning step. Other essential information may be a matter of general knowledge or may have been acquired during previous studies of related procedures.

Objectives and requirements. If the analyst is to determine how effectively the objective of a procedure is being achieved, he must first find out what that objective is. He must thoroughly understand the basic requirements that the routine exists to satisfy. There are few types of projects on which this knowledge is not required. Even on those concerned solely with procedure mechanics, changes cannot be made intelligently until their possible effect on end results has been evaluated.

If information regarding the objectives of a procedure is to be useful, it must be clear, detailed, and complete—not merely some obvious generalization inferred from the name or nature of the activity under study. It is not enough, for example, to observe that the purpose of sales statistical procedures is to provide the information required for planning and controlling the company's marketing operations. Rather, the objective of this particular activity should be thought through and expressed in some such terms as the following. (This statement, of course, is only illustrative and will not apply to all companies.)

The purpose of the sales statistical procedures to be covered by this study is to produce the internal sales data needed for effective planning and control of the following types:

1. Sales planning
   a. Establishing sales volume objectives by territory, industry, and channel of distribution.
   b. Developing the advertising budget and planning the allocation of funds for local advertising.
   c. Evaluating the character and size of the product line.
   d. Developing additional outlets and new channels of distribution.
   e. Determining the need for and location of additional warehouses.
2. Measurement and control of sales results by
   a. Salesman.
   b. Geographic area.
   c. Distribution channel.
   d. Type of industry.
   e. Product class.

Obviously the requirements or objectives of statistical or reporting procedures should be investigated more thoroughly than those designed principally to carry out the routine transactions of the business. But, even on the latter, the analyst will find that careful digging into *all* the purposes of the activity will supply the points of reference needed to discover basic weaknesses.

Organization and personnel. Step two in the survey should ordinarily be that of getting the organization facts. These consist of the following three types of information:

1. The structure of organization, which includes the position titles and job classifications of people participating in the procedure and the lines of authority among them.
2. Names of people manning the organization.
3. Principal functions of each unit.

The first two types can usually be obtained quite readily, although the analyst must guard against accepting formal organization charts without making sure that they are up to date and that they accurately represent the present situation rather than some proposed or idealized arrangement.

Determining the major functions of each unit will often prove more difficult. In the absence of any written definitions of responsibility, the analyst is likely to encounter considerable uncertainty or disagreement about function, particularly where the activities under study include planning or control rather than routine operation. But even where some formal delineation of responsibility exists, there may be significant variations between the plan and the realities of the situation. Here again, therefore, the analyst must exercise care to ensure that he discovers the functions *actually* being performed and not merely nominal ones.

This part of the fact-finding process assumes its greatest importance whenever a large number of organization units participate in the procedure being surveyed. Here the job is essentially one of determining the exact working relationships between departments on matters of common interest which may represent areas of potential conflict or jurisdictional dispute. The specific organization facts to be obtained in this area will vary, of course, with each procedure studied. As an illustration, however, here are some of the questions regarding division of functions that might be raised in a study of the order-processing, shipping, and invoicing procedure of a manufacturing company:

1. Are separate organization units responsible for order processing and invoicing? If so, what is the line of demarcation between their respective functions?

2. What is the relationship between field sales offices and the headquarters credit department on establishing lines of credit and approving individual orders?

3. To what extent do sales headquarters, order, production control, or manufacturing departments have direct contact with customers regarding orders or shipments?

4. To what extent do the field sales offices deal directly with the manufacturing departments?

5. What are the relationships between the order department and the sales force on determining the priority of shipments?

6. What are the relationships among the order, production control, and factory departments on establishing shipping dates, on determining the manufacturing sequence of orders, or on specifying the plant from which the order will be shipped?

7. Is there a clear and logical distinction of duties among the sales, order, and production departments regarding the control and replenishment of finished-goods inventories?

8. If the company manufactures several products at several plants, are the functions of the order department organized or divided among the personnel on a product basis, a plant basis, or a clerical activity basis?

This discussion of organization facts may raise the following question in the reader's mind: Do organization problems fall properly within the scope of a procedures study? The answer is that the effect of organization structure and division of responsibility on performance of the procedure *must* be thoroughly explored if anything approaching a fundamental diagnosis is to be made. To be sure, a procedures project should not be used as the excuse for launching broad organization studies as such. The analyst's concern with these matters should be limited to their impact on the procedure itself. But it is worth emphasis that organization structure has a greater influence on procedure costs or effectiveness than is generally supposed. It will often be found, for example, that a highly complex procedure merely reflects a faulty or cumbersome organization structure. Similarly, poor organization may impede the flow of work or promote duplication and overlapping.

A second reason for digging out the organization facts is that

existing records, reports, and other paper work cannot be intelligently evaluated unless the analyst thoroughly understands the responsibilities to be discharged. The organization chart appearing in Figure 8 is useful in illustrating this point. The sales organization shown is divided into two major parts—a field selling group responsible to a general sales manager and a headquarters staff headed by a chief product manager. The latter group was charged with various sales-planning, policy-formulation, and control functions. The regional managers, on the other hand, were responsible for carrying out the company's marketing plans, policies, and programs through their direction and control of the branch offices.

Quite obviously no far-reaching program of procedures improvement could be carried out in the area covered by this chart unless the analyst first determined specifically and in detail the functions of these two key groups, their relationships to each other, and the information they need to perform their jobs effectively. If the analyst doubts this, let him try to develop a written procedure or structure of management control information involving a number of departments without having an organization pattern into which he can fit procedural responsibilities. Such tasks are hopeless and invariably result in shelving the procedural phases of the study until related organization lines are clarified and jurisdictional disputes settled.

Finally, the organization facts are of value to the analyst in planning the details of the study. They provide an over-all picture of the scope of the project, the division of work, the number of persons and classes of labor employed, and the diversity of functions performed. This information will guide him in determining how much interviewing needs to be done, who should be interviewed, and in what sequence.

Policies. The third element of background information consists of the policies that the procedure is designed to carry out. If the analyst is studying a billing procedure, he will want to know the company's pricing and discount policies; an order-processing procedure, its sales and credit policies; a complaint and adjustment procedure, its return and refund policies; a payroll procedure, its compensation policies; a filing system, its records-retention and -disposal policies.

In addition to discovering what policies are in effect, the analyst should find the answers to such questions as these: Are existing policies reduced to writing and clearly understood by those who

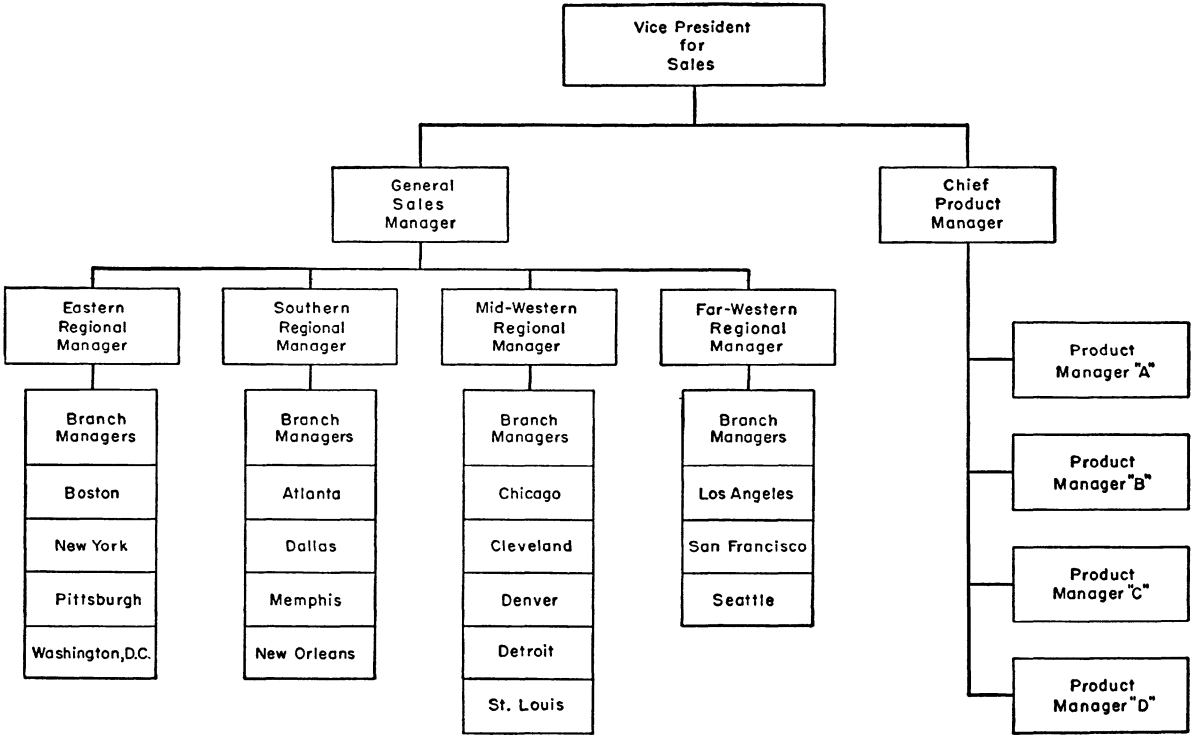


Fig. 8. Organization Structure of Sales Division

must execute them? Are they uniformly interpreted and administered? If not, what are the nature and frequency of the exceptions? Are there any important recurring matters on which policies have not been established?

It may often be necessary to defer this part of the fact finding until the details of procedure performance are studied. Where this is true, the analyst should take care not to lose sight of these questions, since they have an important bearing on the form and effectiveness of the procedure itself.

Details of existing procedure. Once the analyst understands thoroughly the objectives, organization, and policies related to the procedure under study, he is ready to dig into the details of the procedure itself. Following is a check list of facts to be obtained in this part of the survey:

1. Functions and operations.
   a. *What* work is performed?
   b. *When*—that is, in what sequence—are the operations performed?
   c. *Who* performs them?
   d. *How?*
   e. *Why?*
2. Quantitative data.
   a. Volume of work.
   b. Man-hours required.
3. Flow of work.
   a. Degree of stability.
   b. Frequency of movement.
   c. Direction.
   d. Distance.
4. Qualitative data.

Functions and Operations. Dissection of an existing procedure is essentially a matter of breaking it down first into its major elements, or functions, and then into the detailed action steps of which each is comprised. The survey should begin with the operation or document that initiates the routine and should follow some logical sequence until all activities within the defined scope of the study have been covered. Each separate operation and inspection and each movement or delay of work should be recorded in the order of its occurrence and in sufficient detail to permit its evalua-

tion. This means that the analyst should determine not only what is done but also the position title or job classification of the person doing it, the manual or mechanical method by which it is done, and the reason for it.

Obviously, the more detailed this breakdown is, the more opportunities for improvement will be uncovered. Even some of the most minute elements of operating practice, which analysts are inclined to ignore, may hold clues to basic problems or needs. For example, the method of filing documents and the arrangement of each file may not seem worth attention when the facts are gathered. Yet, in one study of an order-handling procedure, information on this particular point brought to light a serious deficiency in the company's order follow-up practices. The study revealed that the order department's file of unshipped orders was arranged by serial numbers. Since this sequence bore no relationship to the promised shipping dates appearing on the orders, a question was raised regarding the basis for following up the factory to ensure fulfillment of delivery promises or to notify customers of probable delays. The answer given to the analyst was that the entire open-order file was audited occasionally for overdue shipments but that no regular factory follow-up or customer-notification procedures were carried on.

Irregular or unusual work is another element that is often overlooked in procedure surveys. There is a tendency to follow the normal flow of work to the exclusion of other phases that often have an important bearing on the problem. These may include special methods for handling nonstandard work, contributory or facilitating activities, or recurring tasks performed at irregular intervals. Questions should always be asked to bring these exceptions to light.

In breaking down the procedure into its operational elements, there is, of course, a point of diminishing returns beyond which further refinement does not pay. It is better, however, for the inexperienced analyst to err on the side of gathering too much rather than too little information. In this way he will be less likely to overlook important clues while gaining the experience that will enable him to distinguish quickly between significant and immaterial details.

The survey of clerical work *methods* is largely a matter of determining fully what types of office machines, equipment, and manual work aids are in use, and what part they play in performance of the procedure. Where forms or reports are prepared on a special

type of office machine, the analyst should determine to what extent the form of the document is governed by the characteristics of the particular machine.

In addition to the specific uses of each office machine, the analyst needs certain supplementary information if he is to evaluate the application of the machine intelligently. This includes machine speeds (average output per operator, not maximum machine capacity), skills required to operate the machine, breakdown and repair experience, and so forth.

Finally, the degree of utilization should be determined for all types of machines and equipment, whether owned or leased. The importance of such information on rented machines is readily evident. But even on items owned by the company, unused capacity may point the way to additional applications or may forestall the purchase of similar equipment by another department whose requirements have increased.

Work aids are the nonmechanical devices of many kinds used to facilitate repetitive clerical operations. They include computation and rate tables, codes, charts, price lists, wiring diagrams, account titles and definitions, and the like. The use and usefulness of these devices should be fully explored during the survey of work methods. In general, the analyst's objective should be to find out if all special data required to perform any part of the routine are readily available, conveniently arranged, and kept up to date.

Determining the purpose of each function, document, or operation is such a fundamental of procedures research that its importance hardly needs emphasis. There are few procedures in which this type of inquiry does not point the way to some curtailment or outright elimination of work. Yet this part of the fact-finding job is often the most poorly done because the real use of a report or record is frequently quite different from its apparent or intended purpose. The inexperienced analyst, therefore, may be easily misled by his own assumptions or by the unintentional misinformation of others.

To avoid such pitfalls, the analyst should remember these two important rules.

1. He must not be dissuaded from his search by the assurances of others that a given activity, record, or report is necessary. He should persist in determining its exact end use so that he may satisfy himself about its value or necessity.

2. He should seek wherever possible to verify, by test checks or actual observation, the statements that operating personnel make to him about the purpose or end use of any clerical product or process.

The reason for many detailed clerical operations is, of course, readily evident and, therefore, need not be made a matter of special inquiry. For example, the analyst does not have to find out why invoices are extended. But, with exceptions such as these, the investigation should be thorough and complete. Particular attention should be given to forms, records, and reports and to checking or inspection operations. Each copy of a report or form should be traced to the individual, or individuals, receiving it, and they should be questioned about the use they actually make of it as well as the purpose it is supposed to serve. Each record should be studied to determine the source, nature, and frequency of references to it or requests for the information it contains. For each checking and inspection operation, the analyst should find out the type and volume of errors detected and the risks that would be incurred if the operation were eliminated.

The following case history illustrates the importance of thoroughness and persistence in digging into the end use of the clerical product.

The headquarters sales organization of a nationwide company maintained an expensive record-keeping system to accumulate operating and maintenance costs on each passenger car in a fleet of 3,000 cars assigned to company salesmen. In studying this activity, the analyst was told initially that the purpose of these records was to reach decisions on when to trade in any given car and to develop the summary information needed to determine which make of car was most economical to own and operate. But, on checking more deeply at other points in the organization, he found that (1) the company followed a uniform practice of trading in each passenger car at 65,000 miles or three years of age—whichever point was reached sooner; (2) for reciprocal-trade reasons, the company consistently divided its new-car purchases among the "low-priced three" according to predetermined percentages.

Hence, the costly record-keeping system referred to above had no bearing whatever on the decisions for which the records were allegedly being maintained.

Quantitative Data. In addition to understanding fully the me-

chanics and purposes of the present procedure, the analyst will generally need to know how much work is performed and how much time is required. These quantitative data are important factors in determining the cost of an operation, in appraising the suitability of present work methods, in comparing them with possible alternatives, in measuring the effect of work elimination on manpower requirements, in spotting bottleneck operations, and so on.

Where a number of clerical operations are performed on a given document, it is not necessary to obtain volume figures on each, since these will be established by a count of the documents themselves. For example, the preparation of an invoice might consist of the following operations: pricing, extending, typing, proofreading alphabetic information, reextending, separating, mailing customers' copies and distributing internal copies. Determining the number of invoices processed per day, week, or other period will automatically produce volume figures for each of these operations.

The quantity of work performed can usually be determined quickly and accurately by reference to supervisors' records of daily production, by the use of serial-numbered forms, or by an actual count of postings, orders, inquiries, forms, letters, etc. Estimates of work volume are frequently misleading and they should not be relied on except when other means of measurement are unavailable.

Unlike volume statistics, performance times should generally be determined for each individual operation or task. This is necessary because of time variations and because individual operations are more subject to change than the procedure as a whole. Whenever an operator spends all or a measurable percentage of his time on a given operation, realistic unit times can be established by dividing by the known volume. Under other circumstances, satisfactory estimates can usually be made through close observation of the work without having to resort to stop-watch measurement.

In addition to these data, the analyst should be alert to the need for other quantitative information that has an important bearing on the choice of methods by which the procedure can best be performed. For example, in the study of an accounts payable routine he would want to know what percentage of customers pay from monthly statements and what percentage pay from invoices covering individual shipments. In analyzing an inventory procedure, he would want to know the quantity of stores withdrawal requisitions for each value category (e.g., 0–25 cents, 25–50 cents, 50 cents–$1,

etc.). In surveying an order-processing procedure, he should find out the number of items in the company's product line, the average number of items per order, the volume of back ordering or partial shipments, and the volume of order changes, that is, reduction or increase in quantities, substitution, deletion, or addition of items, etc.

Flow of Work. Closely related to work volume and unit times are the degree of stability in the flow of work and the frequency, direction, and distance of its physical movement. Since these factors have an important bearing on clerical costs and processing time, they should be studied thoroughly whenever labor savings or acceleration of the procedure cycle are among the project objectives.

The analyst's investigation of the rate at which work flows through the routine should be built around these three questions:

1. What are the size and frequency of peaks and valleys in the work load?
2. What is their effect on procedure costs or time?
3. What are their causes?

The answer to the first question can be found by analyzing the daily volume of work flowing into a given department over a representative period of time. Although day-to-day variations in volume are generally the most frequent and controllable, the analyst should also be on the alert for abnormal fluctuations from week to week, month to month, or season to season. Finally, within each department participating in the procedure, he should look for unevenness in the flow of work between major operations.

The effects of irregularities in volume usually take the form of backlogs and delays, overtime work, and idle time beyond the workers' control. Some of these factors can be measured precisely; others can only be estimated. Nevertheless, a reasonable effort should be made to determine the extent of each in order to create an awareness of the full impact of volume fluctuations. In addition, any staggered work schedule, installed for purposes of smoothing the flow of work, should be carefully studied to determine how the various operations are merged.

The causes of an uneven flow of work may be internal or external, controllable or noncontrollable. When the analyst finds that a fairly uniform quantity of work is always available at the starting point of the procedure, he knows that the irregularities are created within the procedure itself. To isolate their causes, he should ask such questions as these: Is any one department or position ac-

cumulating in-process work and dumping it in large batches onto the next department or position? Is special, irregular, or nonstandard work permitted to interrupt the normal routine? Do the numbers of workers assigned to various operations accurately reflect differences in time required to perform the operations? Or is one part of the personnel overloaded and another underloaded? Have the supervisors whose units participate in the procedure planned and scheduled the flow of work carefully? Is the schedule arranged to keep work from reaching critical stages toward the end of the working day? How much worker time is lost in waiting for facilities or supplies or for the supervisor to open mail, distribute work, and issue instructions? What delays are incurred in getting approving signatures on forms before they can be released for action?

Where variations in volume are caused by departments not directly involved in the procedure, the needs of these units should be carefully evaluated and compared with the cost of meeting them. Once the facts are fully known, a minor adjustment in activities or requirements at these external points will often make possible a substantial leveling of the work load in the area under study.

If the irregularities in the flow of work are found to be noncontrollable—as will frequently be the case when their cause lies outside the company—the analyst must then seek ways to minimize their effect since he cannot remove them. Suggestions for accomplishing this step are contained in Chapter 12.

Step two in surveying the flow of work is to determine the frequency, direction, and distance of the movement of personnel and documents from desk to desk and department to department. Generally, these facts will be recorded during the survey of individual operations although they may be made the subject of an auxiliary study. Where excessive movement or backtracking are found, they should be analyzed to determine whether the cause lies in the procedure (for example, in the sequence of operational steps) or in the physical arrangement of the office. If poor layout appears to be a contributing factor, space and layout diagrams should be prepared showing the location of personnel, equipment, and records and the flow of work among them. An illustration of this type of charting appears in the next section of this chapter.

Qualitative Data. The final area to be explored in the survey of existing procedures is how well the individual functions and operations are performed. Here the analyst should determine the

general condition of records and files, the legibility and completeness of forms, the volume and type of errors detected at various checking points, and so forth. He should also talk with operating personnel at various points in the procedure to find out what difficulties or problems they have experienced because of errors made at earlier points in the process. Where unsatisfactory conditions are found, an effort should be made to discover whether they are caused by inadequate skills or training, by weaknesses or complexity in the procedure, by backlog pressures, or by still other factors.

Cost factors. Having completed the survey of individual functions and operations, the analyst is now ready to conclude the fact-finding process with an investigation of three broad areas applicable to the procedure as a whole. These are: How much does it cost? How effective is it in accomplishing its basic objective? What external conditions or practices not already studied contribute to its cost or complexity?

The facts regarding procedure costs should include the following elements: the salary range and average salary for each job classification; supervisory salaries; depreciation and maintenance charges on owned equipment; rental charges on leased equipment; forms and supply expense; and a pro rata share of space costs. In addition to these normal elements, the analyst should look for other unusual expense items that are peculiar to the procedure and that may lead to the development of savings ideas. These might include heavy communication expense, the cost of office services rendered by an outside agency, and so on.

Armed with these cost figures plus the man- and machine-hour data previously accumulated, the analyst is in a position to determine the cost of individual operations, of methods used in performing various parts of the work, or of the procedure as a whole. Under some circumstances he may also find it worthwhile to develop certain unit cost figures, such as the over-all cost per invoice, per purchase order, or per direct labor dollar. Information of the latter type is particularly useful when some meaningful standard of comparison is available—as it would be, for example, among like units within the same company.

Effectiveness of the procedure. The effectiveness of a procedure in accomplishing its basic objectives is sometimes susceptible of fairly precise measurement and is equally often a matter of judgment. Occasionally the analyst will be able to develop factual data that, by

themselves, will provide the answer. In other cases he will have to rely largely on the opinions of operating personnel. Most often, however, his appraisal will be based on a mixture of both fact and opinion.

The following illustrations will serve at least to indicate the possible range of variation in type of inquiry made and evidence gathered during this phase of the survey.

In evaluating the effectiveness of a shipment-scheduling procedure, the analyst would presumably study an adequate sample of shipped orders to determine the relationship between shipping-promise dates and actual shipping dates. One such study produced the following statistics:

Shipping pattern	No. of orders	Per cent of total
Orders shipped as promised	186	37.2
Orders shipped late:		
1 day	71	14.2
2 days	49	9.8
3 days	35	7.0
4 days	38	7.6
5 days	28	5.6
6 days	14	2.8
7 days	13	2.6
8 days	10	2.0
9 days	8	1.6
10 days to 2 weeks	17	3.4
2–3 weeks	15	3.0
3–4 weeks	10	2.0
4–5 weeks	6	1.2
Total	500	100.0

This simple classification of data not only served as a measurement of procedure effectiveness but also indicated the seriousness of the problem that had to be dealt with.

In the hypothetical procedures project plan appearing in Chapter 8, two of the survey steps listed are: [1]

1. Analyze sample of 50 customer order-status inquiries to determine time taken to reply and completeness of information given.

2. Determine extent to which unsolicited information regarding shipment delays is supplied to customers.

[1] Figure 7, "Scope of Project," sections 3*b* and 3*c*.

Although these facts, when known, would be of real value in appraising procedure effectiveness, they would not, by themselves, be conclusive. Opinions would still have to be gathered to determine what constitutes satisfactory customer service in terms of time taken to reply to inquiries, conditions under which unsolicited information should be furnished, and the like.

It is in evaluating procedures designed to provide control information that the analyst must depend to the greatest extent on opinion rather than fact. Assume, for example, that a study were made of the clerical routines performed for or by the regional sales offices shown in Figure 8. Here the basic questions to be asked would include: How effectively does the present structure of reports and records assist the regional managers in controlling the sales results and selling expense of the branches? Are there any reports that do not fully meet requirements? Are there any control requirements not covered by existing reports? This is the point at which the analyst would have to obtain the views of the regional managers on the adequacy, timeliness, and utility of the existing information. He would, of course, weigh these opinions and supplement them with his own observations, but in either case the evaluation would be a matter of judgment and not of fact.

For additional illustrations of the type of inquiry involved in this phase of the survey, it is suggested that the reader review the section of Chapter 5 entitled "Achievement of the Objective" and that of Chapter 7 entitled "Spotting Problems and Opportunities."

External factors. The final area to be investigated encompasses all those factors outside the framework of the procedure itself that have a bearing on its cost or complexity. Many of these elements—including organization structure, policies, and externally caused peaks and valleys—will already have been studied in earlier parts of the survey. The principal remaining consideration is the basic factor determining the volume of work to be done. For example, the work load in maintaining a continuous inventory record depends largely on the number of withdrawals from stores. The clerical load of the purchasing department is geared to the number of purchase requisitions to be processed.

In examining this factor, the analyst should try to find out if the practices of outside departments are such that the volume of transactions is higher than necessary. Thus, in studying the inventory record procedure referred to above, he would want to determine whether

the using departments are requisitioning stores items so frequently and in such small quantities that an excessive number of requisitions are being processed.

Report, form, and record check lists. Since forms, records, and reports represent the end product of most clerical effort, they provide convenient points of reference for summarizing much of the foregoing material. Accordingly, this section is concluded with a check list of the information to be gathered for each of these three classifications of documents.

The analyst should make a practice of accumulating and including among his working papers a completed copy of each form, record, and report forming a part of the procedures he studies. This will minimize the notes he must make during the survey as well as ensure that all essential information is in front of him when the diagnosis is undertaken.

1. Reports.
   - *a.* Information reported. (If this is not clearly indicated by the captions on the report form, enter in the appropriate columns or sections a full description of the information required.)
   - *b.* Period covered by the report.
   - *c.* Frequency of preparation.
   - *d.* Age of information reported.
   - *e.* Source of each part of the information.
   - *f.* Method of compiling data.
   - *g.* Method of preparing or reproducing report.
   - *h.* Verification or checking procedures.
   - *i.* Responsibility for preparation (organization unit and position title).
   - *j.* Man-hours required.
   - *k.* Number of copies.
   - *l.* Complete routing of each copy.
   - *m.* Purpose of report.
   - *n.* Use actually made of each copy by recipients.
   - *o.* Effectiveness of report. Does it meet the requirements?

2. Forms. Most of the points of information appearing in the report check list are equally applicable to business forms. In addition, however, the following supplementary facts should be gathered whenever forms are studied:

a. Volume of use.
b. Form cost.
c. Information entered at time of origination.
d. Volume and significance of errors.
e. Information added subsequent to origination.
f. Approving signatures required.
g. Use made of each piece of information on the form.
h. Information transcribed to other forms, records, or reports.
i. Ultimate disposition of each copy.

3. Records.
   a. Information recorded in each column or space.
   b. Source of each entry.
   c. Volume of postings.
   d. Frequency of posting.
   e. Method of posting.
   f. Responsibility for maintenance.
   g. Man-hours required.
   h. Method of verifying posted data.
   i. Method and frequency of summarizing posted data.
   j. Equipment in which record is filed.
   k. Arrangement or sequence of filing, type and frequency of visual indexing, etc.
   l. Purpose of record; nature and frequency of references to it or inquiries for the information it contains; types of reports, if any, prepared from it.

Many of the points immediately above will also apply to *files* of forms, correspondence, or other documents, since these are essentially a specialized type of record. In addition, when studying files, the analyst should obtain such further information as the method of sorting documents preparatory to filing, the period of time documents remain in file before being destroyed, the legal or company requirements governing their retention, and so on.

HOW TO RECORD THE FACTS

To compile this vast assortment of data in the most useful form requires that the analyst "take a dose of his own medicine." That is, in recording the information gathered during the survey, he should adhere to the same standards of orderliness and simplicity and the same principles of systemization that he continuously applies to the

work of others. Unless he does this, his subsequent analysis of the facts is likely to be haphazard, incomplete, and unnecessarily prolonged.

Much of the information discussed in the preceding section lends itself readily to charting or diagramming. This technique should be employed wherever possible, for, provided they are skillfully prepared, charts have a number of real advantages over narrative descriptions. Among them are the following:

1. Charts are a simpler, more compact way of presenting a complex process. They make it possible for the analyst to visualize the whole activity more readily as well as to detect significant relationships among its detailed parts.

2. The use of standard charting techniques can speed up the survey in two ways. (*a*) It lends orderliness and direction to the fact-finding process. It removes uncertainty about what information should be gathered next. (*b*) The use of symbols and flow lines reduces the need for descriptive material and cross-reference notations.

3. Graphic presentations provide greater assurance that all operations in the existing routine have been accounted for.

4. They also facilitate analysis, since complexity, duplication, backtracking, and other weaknesses stand out more vividly when the procedure is charted.

5. Charts or diagrams can be used to advantage in comparing present and proposed procedures and in dramatizing the effect of recommended changes.

Procedures analysts have devised a large number of different charting techniques—many of them merely variants of each other. Four of the basic types used most commonly are discussed and illustrated in this chapter. These four are sufficiently flexible to cover most requirements, and although they have met the test of long use, unquestionably many other types will be found equally satisfactory. The important consideration is *not* that any one staff adopt these or some other specific set of charts, but that those which are adopted meet the following specifications:

1. They should be simple, concise, and easy to understand.

2. They should be sufficiently adaptable to portray complex as well as simple situations with equal clarity and completeness.

3. They should be used uniformly by the entire staff so that those who have not participated in a particular survey can quickly assimilate the essential facts and assist in the analysis and developmental phases

of the study. This means that everyone on the staff should be trained to use the same type of chart for a given situation, to use the same symbols, to record the same kinds of information, and to record it in the same detail.

The four types of graphic presentation considered below are (1) organization charts, (2) procedure flow charts, (3) work-distribution charts, and (4) layout flow charts.

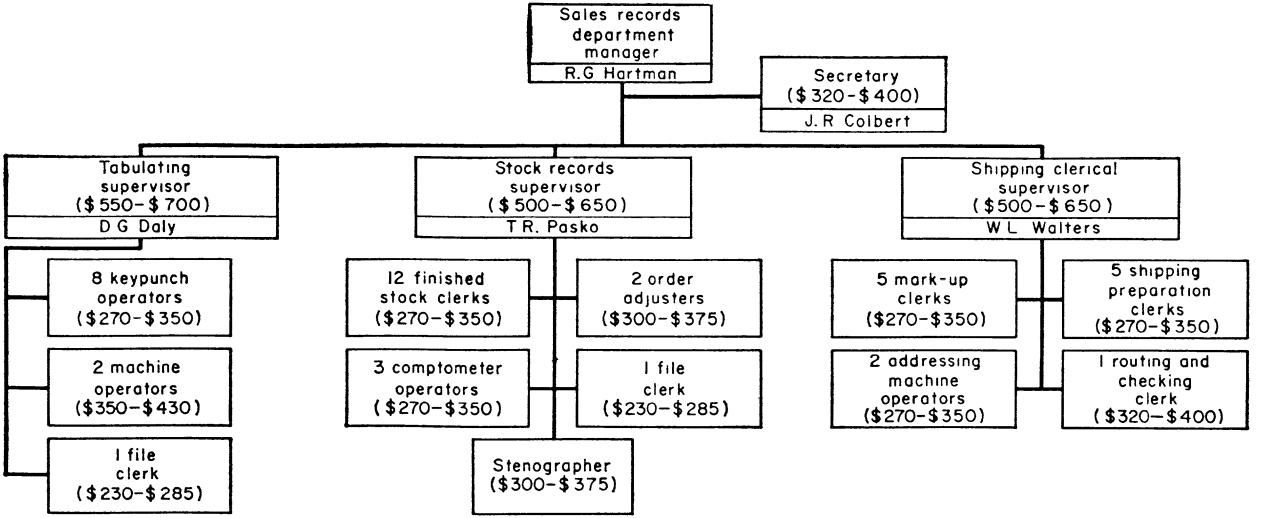
Organization charts. Organization charts are normally thought of as a device that pictures the *structure* of organization—that is, the individual jobs or positions comprising a unit and the lines of authority and responsibility between them. Procedures analysts will find that this conventional type of chart also provides a convenient means for recording such related information as the names of personnel, the salary range of each job or position, and the major functions performed. Figure 9 shows one method of arranging this information.

An important point to bear in mind is that this type of chart should not be used to record the individual tasks making up the work of the unit. The list of functions should be limited to broad areas of activity so that the analyst can quickly visualize basic responsibilities and relationships before becoming immersed in the details of a routine.

Procedure flow charts. Among procedures analysts, process or flow charts are probably the most widely used type of graphic presentation. Essentially, these are nothing more than a description of individual operations connected by flow lines to indicate sequence and movement. Symbols are also commonly used to designate the nature of each operation. These not only make possible the abbreviation of descriptions but also facilitate the classification and analysis of operations.

One of the most useful devices of this type is the "skeleton" or vertical flow chart illustrated in Figure 10. This chart is equally adaptable to the recording of simple and complex routines, but its use is particularly recommended when the procedure to be analyzed has some or all of the following features:

1. Many tied-in supplementary routines or tributaries to the main flow of work.
2. Many records, each of which is used at several different times in the procedure cycle.
3. Considerable backtracking.

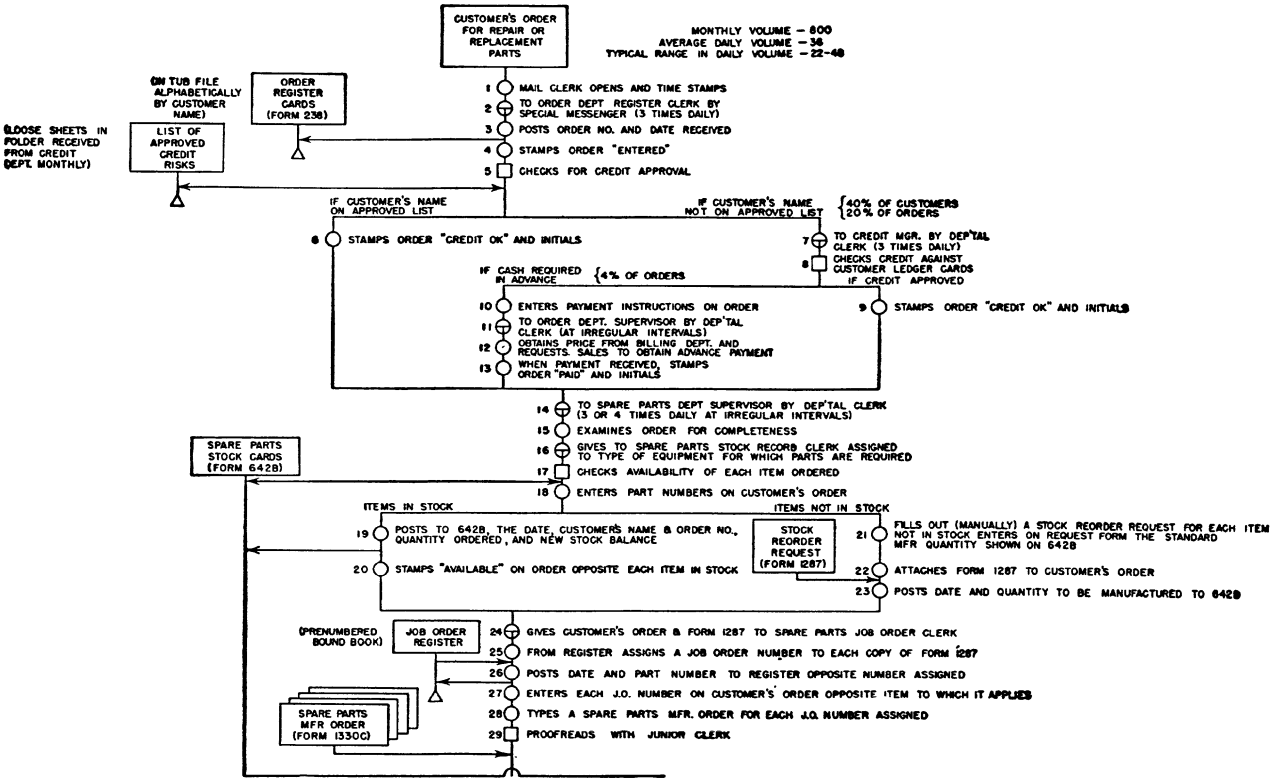


1. Summarize orders by style, model, and size as basis for
   (a) Limiting sales to piece goods purchase commitments and to factory capacity on various types of work
   (b) Supplying sales requirements information to production
   (c) Supplying to merchandising the information required for placing reorders
2. Process order changes and adjustments
3. Prepare shipping orders for stock room

1. Maintain records of the following by style, model, and size
   - Sales orders
   - Cuttings
   - Seconds
   - Finished goods inventories
2. Apply finished stock to orders
3. Postpone or adjust quantities on orders

1. Combine merchandise for one customer
2. Determine when sufficient merchandise is available for one customer to constitute an economical shipment
3. Prepare shipping labels
4. Route shipments
5. Maintain records of shipments
6. Review orders and call past due items to attention of stock records section

Fig. 9. Functional Organization Chart


CUSTOMER'S ORDER FOR REPAIR OR REPLACEMENT PARTS
MONTHLY VOLUME – 800
AVERAGE DAILY VOLUME – 36
TYPICAL RANGE IN DAILY VOLUME – 22-48
ON TUB FILE ALPHABETICALLY BY CUSTOMER NAME)
ORDER REGISTER CARDS (FORM 238)
LOOSE SHEETS IN FOLDER RECEIVED FROM CREDIT DEPT. MONTHLY)
LIST OF APPROVED CREDIT RISKS
1 MAIL CLERK OPENS AND TIME STAMPS
2 TO ORDER DEPT REGISTER CLERK BY SPECIAL MESSENGER (3 TIMES DAILY)
3 POSTS ORDER NO. AND DATE RECEIVED
4 STAMPS ORDER "ENTERED"
5 CHECKS FOR CREDIT APPROVAL
IF CUSTOMER'S NAME ON APPROVED LIST
IF CUSTOMER'S NAME NOT ON APPROVED LIST
40% OF CUSTOMERS
20% OF ORDERS
6 STAMPS ORDER "CREDIT OK" AND INITIALS
7 TO CREDIT MGR. BY DEP'TAL CLERK (3 TIMES DAILY)
8 CHECKS CREDIT AGAINST CUSTOMER LEDGER CARDS IF CREDIT APPROVED
IF CASH REQUIRED IN ADVANCE
4% OF ORDERS
9 STAMPS ORDER "CREDIT OK" AND INITIALS
10 ENTERS PAYMENT INSTRUCTIONS ON ORDER
11 TO ORDER DEPT. SUPERVISOR BY DEP'TAL CLERK (AT IRREGULAR INTERVALS)
12 OBTAINS PRICE FROM BILLING DEPT. AND REQUESTS SALES TO OBTAIN ADVANCE PAYMENT
13 WHEN PAYMENT RECEIVED, STAMPS ORDER "PAID" AND INITIALS
14 TO SPARE PARTS DEPT SUPERVISOR BY DEP'TAL CLERK (3 OR 4 TIMES DAILY AT IRREGULAR INTERVALS)
15 EXAMINES ORDER FOR COMPLETENESS
16 GIVES TO SPARE PARTS STOCK RECORD CLERK ASSIGNED TO TYPE OF EQUIPMENT FOR WHICH PARTS ARE REQUIRED
17 CHECKS AVAILABILITY OF EACH ITEM ORDERED
18 ENTERS PART NUMBERS ON CUSTOMER'S ORDER
SPARE PARTS STOCK CARDS (FORM 6428)
ITEMS IN STOCK
ITEMS NOT IN STOCK
19 POSTS TO 6428, THE DATE, CUSTOMER'S NAME & ORDER NO., QUANTITY ORDERED, AND NEW STOCK BALANCE
20 STAMPS "AVAILABLE" ON ORDER OPPOSITE EACH ITEM IN STOCK
STOCK REORDER REQUEST (FORM 1287)
21 FILLS OUT (MANUALLY) A STOCK REORDER REQUEST FOR EACH ITEM NOT IN STOCK ENTERS ON REQUEST FORM THE STANDARD MFR QUANTITY SHOWN ON 6428
22 ATTACHES FORM 1287 TO CUSTOMER'S ORDER
23 POSTS DATE AND QUANTITY TO BE MANUFACTURED TO 6428
(PRENUMBERED BOUND BOOK)
JOB ORDER REGISTER
24 GIVES CUSTOMER'S ORDER & FORM 1287 TO SPARE PARTS JOB ORDER CLERK
25 FROM REGISTER ASSIGNS A JOB ORDER NUMBER TO EACH COPY OF FORM 1287
26 POSTS DATE AND PART NUMBER TO REGISTER OPPOSITE NUMBER ASSIGNED
27 ENTERS EACH J.O. NUMBER ON CUSTOMER'S ORDER OPPOSITE ITEM TO WHICH IT APPLIES
28 TYPES A SPARE PARTS MFR. ORDER FOR EACH J.O. NUMBER ASSIGNED
29 PROOFREADS WITH JUNIOR CLERK
SPARE PARTS MFR ORDER (FORM 1330C)

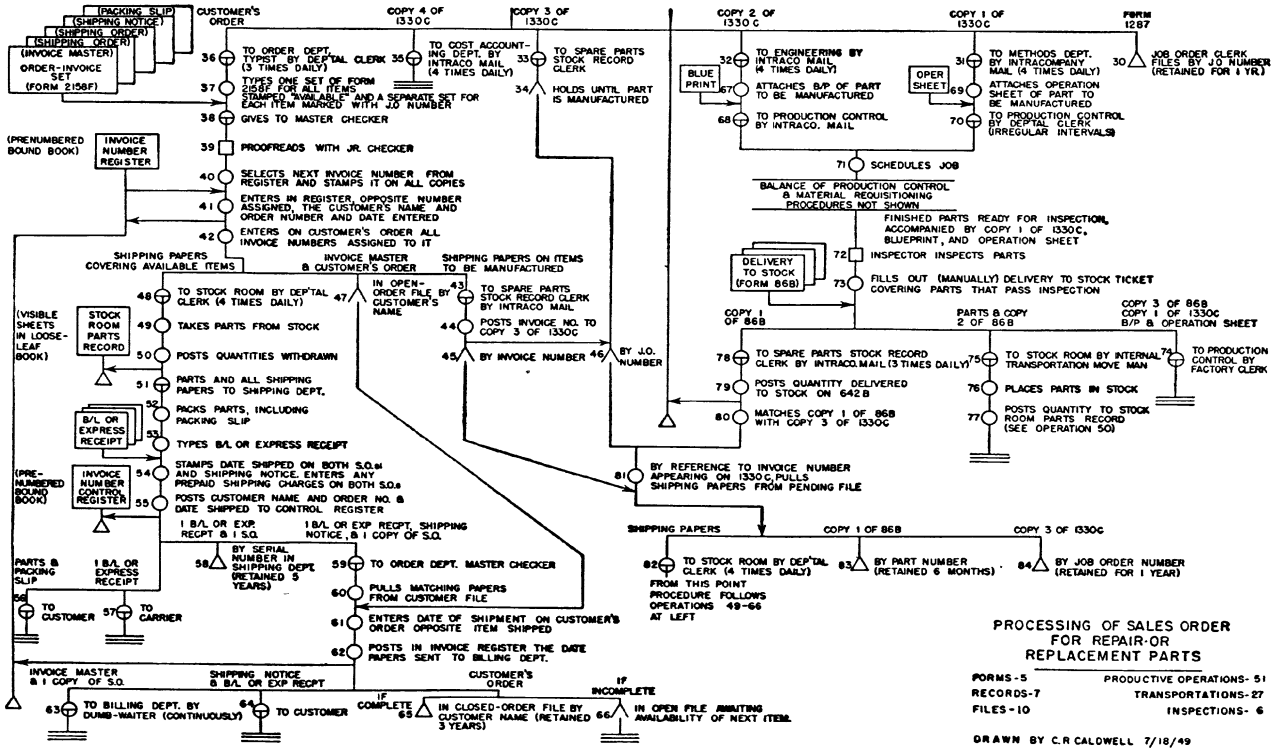


Fig. 10. Skeleton Flow Chart

4. Alternative methods of handling work under different circumstances.
5. Division of work into various classifications, each of which passes through a somewhat different routine.

The structure of a skeleton flow chart is made up of the following symbols and lines:



Productive Operation. Creating, adding to, or altering a form, record, letter, or report.



Transportation. Moving work from one person or location to another.



Inspection. Checking or verifying a piece of work.



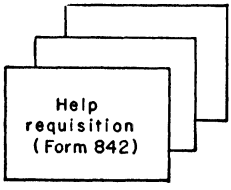
Temporary or "Open" File.



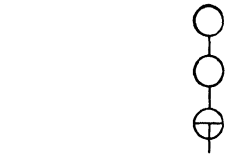
Permanent File.



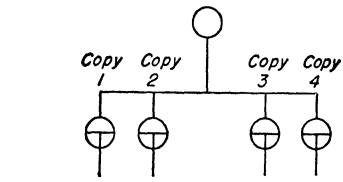
Record or Single-copy Form or Report.



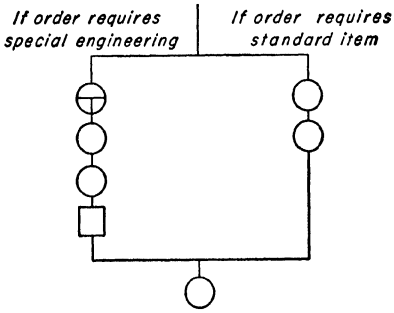
Multiple-copy Form or Report.



Vertical lines indicate flow of work from one operation or location to another.



Rake shows distribution of multiple copies of a form.



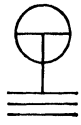
Separation of work flow shows alternative routines for handling different classes of work. If, at some subsequent point, both routines are again identical, the vertical lines are remerged.



Double arrow connecting vertical lines indicates checking or balancing of one form or record against another.



Single arrow connecting vertical lines indicates posting from a form to a record, attachment of one form to another, etc.



Three horizontal lines beneath a transportation operation indicate that the form has been sent to a department or individual outside the scope of the survey.

In addition to showing what work is done and in what sequence, skeleton flow charts are a convenient means for recording most of the other significant facts about the existing procedure. These include the method by which each step is performed, the class of personnel performing it, the volume of work, and the frequency of occurrence. (Although time information and distances of movement may also be included, other types of charts discussed below are generally more suitable for recording these data.)

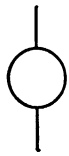
Following are a number of suggestions that will help the analyst simplify the construction of skeleton flow charts as well as increase their usefulness:

1. Descriptions of operations appearing opposite each symbol should be brief but clear and definitive. Avoid the use of general terms such as "handles," "processes," etc. Do not write "checks order" if the operation consists of checking order for completeness and for adequacy of total weight.

2. The use of descriptive words implied by chart symbols is unnecessary. For example, do not enter "Files" opposite a temporary file symbol or "Sends" opposite a transportation symbol.

3. It is not necessary to enter on the chart the specific information recorded on each form unless that information is peculiar to the operation itself. For example, if a given operator completes the heading of a form, it is sufficient to state "Fills in heading of Customer Claim Record (Form 1318B)." The details of the operation can then be obtained, if necessary, by reference to a copy of the form, which the analyst will have among his working papers. However, if the operation is limited to the addition of one or a few specific entries, the information recorded should be described in terms of the captions appearing on the form.

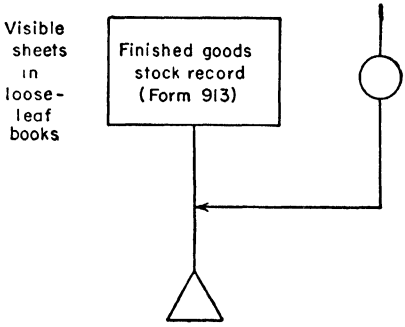
4. Description of the means by which operations are performed should include such information as the type of office machines, equipment, and work aids used; the manner in which work is transported; and so on. For example:



Calculates extensions on key-driven computer.



To stock room by special messenger (hourly).

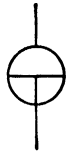


Posts date, requisition number, quantity, and new balance to stock record.

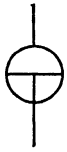
5. Where productive operations are not done daily, the frequency of performance should be specifically stated. The recording of this information can be simplified by entering one of the following abbreviations at the right of the operation description:

W—Weekly
PP—Pay Period
M—Monthly
Q—Quarterly
S—Semiannually
A—Annually

6. Where acceleration of the procedure cycle is among the project objectives, particular attention should be given to the frequency of movement in the flow of documents. This information should appear as part of the description of each transportation operation. For example:



To stock room by pneumatic tube (continuously).



To engineering department by departmental clerk (two or three times daily at irregular intervals).



To credit department by intracompany mail (four times daily).

7. Every vertical line on the chart should end either with a permanent-file symbol or with three horizontal lines indicating that the limits of the survey have been reached. Use of these symbols is important, since open lines will immediately suggest that the recording of a part of the routine has not been completed.

8. To facilitate reference to the chart, number the operations in the sequence of their performance. If different parts of the routine are performed concurrently, assign consecutive numbers to the operations in a given flow line until a logical breaking point occurs. Then number those in the parallel flow line.

9. Identify the chart by:
   a. A title which indicates clearly the process covered.
   b. The name of the person who prepared it.
   c. The date prepared.

10. At the bottom of the chart, record the totals of each symbol. For example:

SUMMARY

Forms	7
Records	3
Files	6
Reports	2
Productive operations	59
Transportations	21
Inspections	3

A second useful technique for recording procedure details is the columnar or horizontal flow chart illustrated in Figure 11. The distinguishing feature of this chart is the arrangement of data in columns headed by the names of the organization units or positions participat-

ing in the procedure. When the chart covers an interdepartmental procedure (such as the one illustrated), the names of the various departments appear as column heads; for an intradepartmental procedure, the names of sections, subsections, or individual jobs within the department are used as column heads.

This type of chart has two advantages over the skeleton flow chart just described. (1) It shows more clearly the total operations of a given job or organization unit as well as relationships between jobs or units. This is true because all the tasks of a given position, section, or department appear in a single column with each horizontal line marking the movement of work or point of contact between positions or units. (2) The columnar-type chart is somewhat easier to handle since it can be unfolded and read from left to right rather than from top to bottom, as is necessary with a vertical flow chart.

Notwithstanding these advantages, columnar charts have definite limitations. If the process involves considerable backtracking, frequent movement of work, or many multiple-copy forms, columnar charting will produce a maze of crossing flow lines more likely to confuse the picture than to clarify it. In addition, columnar charts do not readily lend themselves to processes involving split operations or alternative treatments. In general, therefore, the skeleton flow chart should be used when any of these complexities exist, and the columnar chart should be limited to simpler processes.

Work-distribution charts. Whenever the procedure being studied encompasses most or all of the work of an entire organization unit, the list of major functions previously recorded on an organization chart should be expanded into a detailed list of tasks performed by each employee.

A common method of arranging this information is the work-distribution chart appearing in Figure 12. The major functions or activities of the unit are listed in the left column of the chart. Names and job titles of employees are spread across the top of the sheet in separate column headings (where two or more people perform identical tasks, their names are grouped in a single column). The contributions of each individual to the major functions of the group are then described in the appropriate horizontal segments of each column. An important additional feature is the recording of time spent by the individual employee on each task and by the unit as a whole on each function.

Properly prepared, the work-distribution chart can be one of the

RECEIVING AND INCOMING

RECEIVING

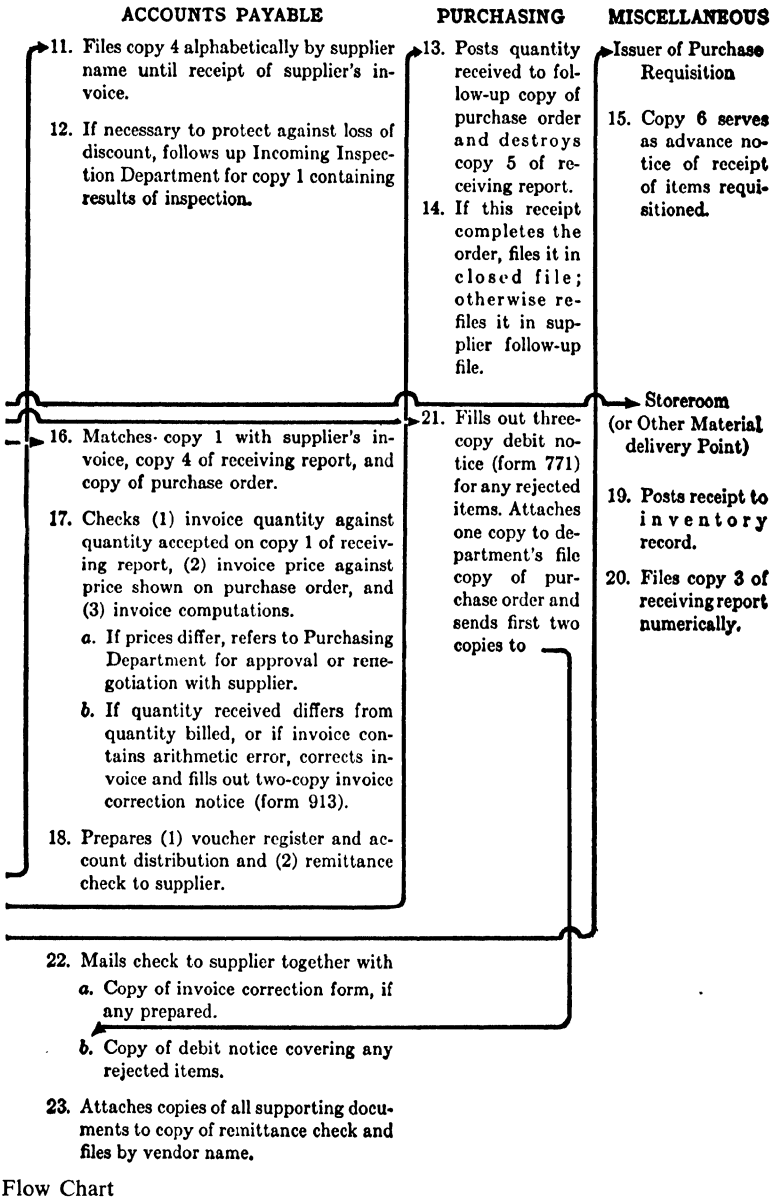
1. Receives copy of each purchase order (form 534) and files numerically in tub file.
2. Upon receipt of incoming shipment, pulls purchase order from file.
3. Counts or weighs items received and compares count with quantities shown on purchase order and supplier's packing list. (If first count disagrees with packing list, a different receiving clerk makes recount.)
4. Fills out seven-copy receiving report (form 832).
   a. If quantity received differs from packing list, enters on receiving report: amount of discrepancy, names of both checkers, and how quantity was measured.
   b. If any items are damaged or broken, enters on receiving report: quantity and condition of these items and condition of package in which received.
5. Records quantity received on purchase order. If this completes order, files it in closed file; if not, refiles it in tub file.
6. Files copy 7 of receiving report numerically and distributes other copies as follows:
   1, 2, 3 } With undamaged items
   4. With packing list
   5
   6
7. Holds damaged or broken items and files claim against carrier.

INSPECTION

8. Inspects items and enters on copies 1, 2, and 3: quantity accepted, quantity rejected, and reasons for rejections.
9. For items that fail to pass inspection, fills out rejected materials identification tag (form 1312), attaches it to rejected items, and sends them to shipping room for return to supplier.
10. Distributes copies of receiving report as follows:
    1
    2
    3. With accepted material

Fig. 11. Horizontal

INSPECTION PROCEDURE



Flow Chart

WORK DISTRIBUTION—PLANT SHIPPING DEPARTMENT

Functions	Total Hrs. per Week	Job Duties									
		Supervisor W. K. Forman	Hrs. per Week	Typists (3) J. R. Lang, D. L. Hilton, R. S. McCauley	Hrs. per Week	Senior Clerk G. L. Lindquist	Hrs. per Week	Junior Clerk J. M Martin	Hrs. per Week	Clerk-Messenger D. F. Jacoby	Hrs. per Week
Recording and Controlling Orders	17	Checking orders against accompanying manifest	2			Checking scheduled shipping dates of orders in open file for release to factory	3	Date-stamping and registering orders Posting shipped orders to register Filing completed orders	5 3 4		
Routing Shipments	5	Obtaining routing instructions by telephone from Traffic Department	5								
Preparing and Dispatching Carloading Instructions	50	*Proofreading loading tickets*	3	*Typing three-copy* loading tickets (Form 1318A)	30	*Proofreading loading tickets*	4			Separating and distributing loading tickets to factory departments and picking up shipped tickets Filing copy of loading tickets	10 3
Preparing Shipping Notices	51			Typing five-copy shipping notices (Form 863C) Typing daily list of shipments (Form 2182)	30 10	Proofreading shipping notices and daily list of shipments	8			Separating copies of shipping notices and delivering them to mail room	3

Preparing Bills of Lading and Switching Orders	79			Typing four-copy bills of lading Typing two-copy yard switching order (Form 1146)	25 10	Proofreading bills of lading and switching orders Checking computations of product and dunnage weights	6 8	Computing product and dunnage weights Filing copies of bill of lading and switching order	11 7	Separating copies of bills of lading and delivering to office of carrier for signature	12
Preparing Order and Shipment Statistics	17	Reviewing summaries of open orders and shipments	2			Preparing semiweekly summary of open orders for factory departments Drafting weekly shipping and finished stock reports	4 3	Preparing daily summary of shipments by product and size	8		
Following up on Shipped Orders	16	Answering Order Department inquiries on status of orders	7			Answering Order Department inquiries Preparing weekly list of past-due orders	2 2			Obtaining information from factory departments on status of orders released for shipment	5
Processing Order Changes	6							Attaching order-change notices to file copy of order	2	Distributing order-change notices to factory departments	4
Supervision	17	Maintaining attendance and production records Spot-checking work of department Answering workers' questions Miscellaneous personnel matters	3 5 6 3								
Miscellaneous	22	Conferences and contacts with other departments	4	Typing correspondence and reports	15					General filing	3
	280		40		120		40		40		40

Fig. 12. Work Distribution—Plant Shipping Department

analyst's most useful and versatile tools. It assists him in determining where his effort should be applied. That is, it focuses his attention on the more important parts of the routine and thus helps him avoid the mistake of spending too much time trying to improve a minor activity. It is equally valuable in bringing to light many contributory or auxiliary activities and special or irregular jobs which workers might otherwise forget to mention when flow charts are being drafted. In this way it serves as a guide to the preparation of procedure charts and a further means of checking their completeness. Finally, the work-distribution chart plays an important part in the analysis phase of procedures research. It highlights weaknesses in the division of labor and helps in the evaluation of savings resulting from procedure improvements. By having a record of the time spent on each task, an analyst is less likely to be drawn into controversy over the effect of work elimination on manpower requirements.

Layout flow charts. The effect of office layout on the flow of work can be more readily analyzed by preparation of a layout diagram similar to that shown in Figure 13. This is simply a conventional type of layout drawing with flow lines indicating the movement of work from desk to desk. The area and equipment are drawn to scale so that actual distances of movement can be determined and compared with alternative layouts. The manner in which backtracking and excessive movement can be eliminated by changing the layout is illustrated by the "after" chart of this same area shown in Figure 19, page 245.

Other working papers. All the information developed during the survey will by no means be recorded in chart form. The project working papers will also include statistical data, narrative information, results of tests or experiments, samples of forms and reports, etc. The analyst should train himself to prepare these papers neatly and legibly at the first writing, to identify them clearly, and to index or organize them so that subsequent reference will be facilitated. Untidy or badly organized notes not only encourage haphazard thinking but also cause a great deal of fumbling and delay in completion of the study.

HOW TO CONDUCT THE SURVEY

The preceding sections of this chapter are concerned with the *end product* of a procedures survey. The first covers its substance, or the

kinds of information to be gathered; the second, its form, or the manner of recording procedures facts. This section contains a number of additional pointers that will help the analyst get better survey results as well as create the basis for successful performance of the remaining project steps.

Sources of information. There are three principal means of digging out the information previously discussed: (1) by interviewing operating personnel; (2) by observing actual performance of the work and studying the product created; and (3) by reviewing formalized organization charts, definitions of responsibility, job descriptions, standard operating instructions, and the like. No one of these means should be relied on exclusively. Each has its place in the survey process, but each, also, has its limitations.

Assuming that the way has been properly cleared with the line executives concerned, the initial point of contact with each organization unit should, of course, be with the supervisor in charge. The specific information to be gathered at this point will vary widely depending on the nature of the study and the amount of background information required by the analyst. Unless he is already thoroughly familiar with all the conditions surrounding the procedure to be studied, he should discuss with the supervisor the nature of the work performed and its relation to other departments or functions. If the procedure closely follows or controls some manufacturing, materials movement, or storeskeeping process, he should also observe the physical operations sufficiently to visualize their tie-in with paper work.

Having thus oriented himself, the analyst should then obtain from the supervisor most of the other background to the actual performance of the procedure. This includes statements of policy, organization structure and personnel, major functions performed, and the external conditions or requirements affecting the unit's operations. Finally, the analyst should find out at this point enough information about the procedure itself to serve as a guide in making the detailed survey. He should ask the supervisor to outline chronologically the major steps in the process and to suggest the names of key employees who should be interviewed because of their job knowledge, their importance to the routine, etc.

The work supervisor should seldom be relied on to supply the full details of the procedure, for too often there is a vast lag between what is actually being done and what he thinks is being done. The analyst, therefore, must *see for himself*. He should follow the routine step by

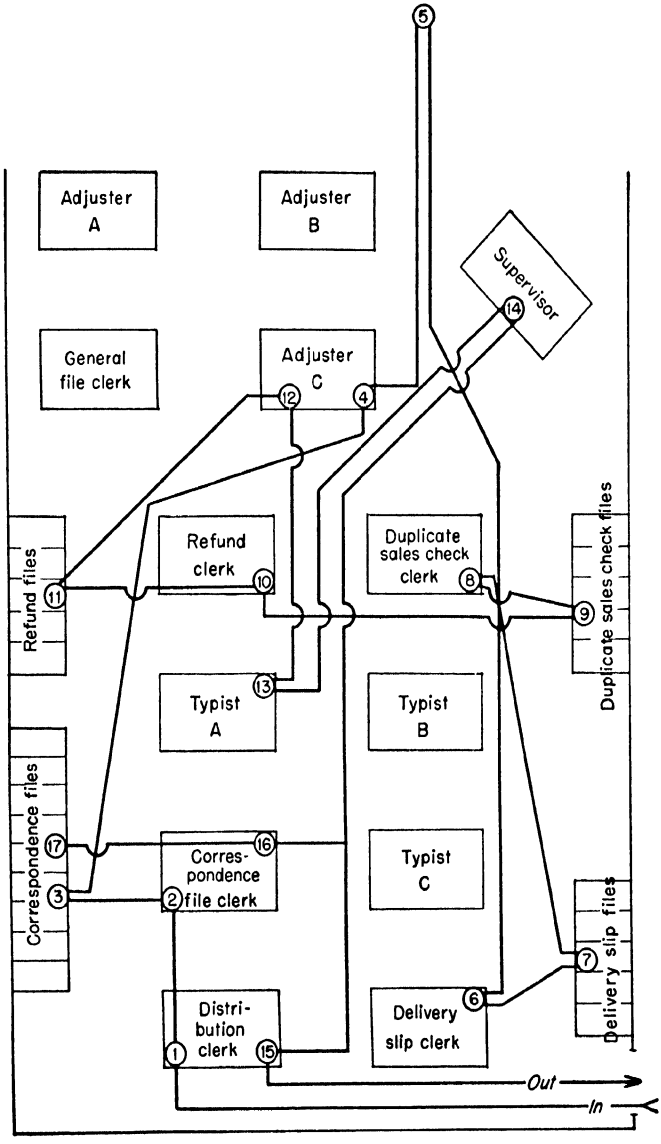


Fig. 13. Layout Flow Chart of Complaint and Adjustment Department Before Rearrangement of Layout

Description of Operations

For Figure 13

1. Customer's letter of complaint delivered to distribution clerk, who attaches tracing slip (Form 240A) and assigns complaint to an adjuster.
2. Passes complaint to correspondence file clerk.
3. Correspondence file clerk obtains any previous correspondence from or to the customer and attaches it to the complaint.
4. Passes the complaint to the adjuster designated on tracing slip.
5. If complaint covers a charge purchase, adjuster checks customer ledger card in accounts department for record of the purchase.
6. If ledger card contains a record of the purchase or if complaint covers a cash-payment purchase, adjuster gives documents to delivery slip clerk for further checking.
7. Delivery slip clerk checks files for evidence of delivery of the merchandise and enters findings on tracing slip.
8. If no evidence of delivery is found, complaint is handed to duplicate sales check clerk.
9. Duplicate sales check clerk searches files for evidence of purchase and enters finding on tracing slip.
10. If a cash-payment purchase, passes complaint to refund clerk.
11. Refund clerk searches files to determine whether an adjustment check has already been drawn and sent to customer. Enters findings on tracing slip and returns complaint to adjuster.
12. Adjuster examines findings, writes adjustment instructions on tracing slip, and gives complaint to typist.
13. Typist prepares letter to customer, attaches to complaint, and gives to supervisor.
14. Supervisor reviews all documents, signs original of letter, and gives to distribution clerk.
15. Distribution clerk mails letter.
16. Supervisor gives carbon copy of letter plus all other complaint documents to correspondence file clerk.
17. Correspondence file clerk files documents.

step, sitting down with individual workers to find out exactly what they do and how they do it. And because even the worker may neglect to mention some significant points, the analyst should watch the actual operations, examine the finished product, look into all files and record cabinets, and so on.

Interviewing operating personnel. Operator attitudes toward any given procedures study and the recommendations it produces are largely conditioned by the analyst's fact-finding interviews. Chapter 6 outlined the principles of conduct that the analyst should observe in all his contacts with the line organization. Following are some additional suggestions applying specifically to procedures interviews:

1. Before each meeting, carefully think through the information to be obtained and find out something about the interests and background of the person to be interviewed.

2. Be considerate of his time. Remember that he has a regular job to do. Make a definite appointment that fits conveniently into his working schedule.

3. Try at the outset to overcome any suspicion he may feel by taking the mystery out of the project. Build a background and receptivity that will make him want to understand and throw light on the problem under study. Even though some general announcement about the project and its objectives may already have been made, take time to explain its purpose simply but thoroughly. Raise his sights by telling him something about how the study is being conducted and how his job fits into the over-all procedure.

4. Conduct the interview on a friendly, informal basis. Guard against the danger of being intense or absorbed in the subject. A little "lightness of touch," if skillfully employed, can often help to relieve tension at the beginning. A casual manner plus a genuine interest in the operator's work and his problems will maintain a comfortable atmosphere throughout the interview.

5. Keep from dominating the conversation. Let the operator do most of the talking. In this way, even though the conversation gets off the track occasionally, the analyst is likely to find more clues to operating problems than if he tries to channel the interview too tightly.

6. Use care in phrasing questions. In trying to uncover the purpose of an operation, be sure that the questions asked do not contain an implication of criticism. When seeking opinions, keep from asking leading questions.

7. Encourage the operator to talk freely about the difficulties he has experienced. Ask for his ideas on possible improvements. Make clear to him that the project is a joint undertaking and that everyone who participates in it will share in the credit.

8. Explain to him why the information requested is needed and how it will be used.

Verifying the facts. At the conclusion of the survey, the analyst should ask the people with whom he has worked to help him check the completeness and accuracy of his notes, flow charts, and other working papers. This process of verification has several important values: (1) It assures the analyst that the data on which he will base his conclusions are trustworthy. It enables him to fill in the gaps and clear up the misinterpretations that are bound to develop during the initial survey. (2) It gives him another opportunity to obtain improvement suggestions from the operating personnel. Some of the best ideas are usually contributed at this point because the work supervisor gets a better perspective of his own operations in relation to the whole. (3) In anticipating this check on the thoroughness and accuracy of his fact finding, the analyst is likely to dig more persistently, to organize his material more logically, and to depict facts more clearly. (4) By being given a chance to examine the survey results, the operators again feel that the analyst has taken them into his confidence. By seeing what has been recorded, they can satisfy themselves that their work has been properly represented and that none of the facts have been withheld from them.

Developing improvements during the survey. A certain amount of designing, planning, and testing of ideas should accompany the procedures survey. As each function or routine is explained, possible short cuts or alternative methods will occur to the analyst. He should not simply jot these ideas down for future use but should try, as they arise, to think of the evidence he will utimately need to evaluate them. In this way his fact finding will be more purposeful, and he will save a great deal of call-back time during later stages of the project.

Moreover, by thinking creatively as the facts are gathered, the analyst is often able to suggest improvements which can be put into effect immediately. However minor these changes may be, they create, early in the study, a predisposition to act on the recommendations he develops.

Modifying the project. Throughout the survey the analyst should be continuously alert to the need for revising the scope or objectives of the study. This does not mean that he should chase blindly down every avenue that the survey opens up. But, at the same time, when new evidence alters his conception of underlying conditions or problems, he should be quick to adjust his program to the revised needs or to abandon nonproductive parts of the work.

Chapter 10

CHANGING THE SUBSTANCE OF A PROCEDURE

Having completed the procedures survey, the analyst now has before him the following types of working papers:

1. Organization charts.
2. Policy statements.
3. Procedure flow charts.
4. Layout charts.
5. Work-distribution charts.
6. Volume, time, and cost data.
7. Samples of forms, records, and reports.
8. Descriptive material covering procedure objectives, effectiveness, complexities, irregularities, etc.

These are the raw materials out of which the analyst must fashion his finished product. To do this, he must not only correlate and analyze a great mass of detail but also relate the details to the whole picture. He must not only conceive theoretically sound solutions and improvements but also visualize the practical operating consequences of each.

Since no two procedure problems are exactly alike, the factors to be considered in making the analysis will, of course, vary widely from project to project. Three rules of diagnosis, however, will help the analyst achieve the best results on any type of project:

1. Relate the analysis to the objectives of the study. Keep your attention centered on *what you are trying to accomplish.* Make certain that all the information gathered is evaluated in the light of the desired end results, whether they be lower costs, faster action, tighter control, closer coordination, fewer errors, greater flexibility, or better service.

2. Develop the habit of *challenging every detail*—every function, record, report, or operation. Force yourself to think of at least one different way, no matter how sound the present method may seem. This practice will not always produce a better way, but it will help to develop the critical, experimental point of view out of which major improvements are born.

3. Be suspicious of the experience of others as well as of your own preconceptions. Avoid the temptation to copy systems just because they have proved to be satisfactory in other companies. Be equally wary of the tendency to treat all problems alike by forcing them into the framework of a technique or method you have used elsewhere. There is no such thing as a "one best way" of performing a single function in all businesses or all functions in a single business. The end result of every procedures study should be a set of recommendations that have been custom-made to fit the particular policies, work volume, information or service requirements, and other conditions affecting the activity under review.

As a more specific guide, this and the subsequent four chapters outline a systematic approach to the analysis and development phases of procedures improvement work. In addition, they suggest possible solutions to the problems or weaknesses that occur most frequently.

The first two of these chapters are concerned with evaluating and modifying the *substance* of a procedure, that is, the objectives achieved and the character of the work performed. Chapters 12, 13, and 14 deal with the development of simpler methods of performing essential work. Thus, in large part, the three succeeding chapters focus on the physical tools through which paper work is performed, that is, office machines, printed forms, office layout, and the like.

The ideas presented in these five chapters are by no means a complete list, nor are they equally applicable to every type of procedures study. They are used principally to illustrate the great variety of improvement opportunities that exist and in that way, perhaps, to stimulate the flow of additional ideas in the mind of the reader.

This material is built around the top-management approach to procedures analysis that was developed in Chapter 5. Specifically, it contains examples of possible improvements in each area covered by the following questions:

1. Can the procedure be improved in such a way that its basic objective will be more fully achieved?

2. Can the procedure be simplified or work volume reduced by

modifying such external factors as policies, organization structure, or the practices or performance of other departments?

3. Is each basic function and each operation necessary?
4. Does it duplicate or overlap another function or operation?
5. Can the necessary work be performed in a simpler, faster, or more economical way?

Before these five steps in the analysis are discussed individually, two general observations should be made about them. (1) They overlap to a certain extent, for more than one of them might uncover the same weakness or opportunity. Nevertheless, each step will contribute importantly to the study, and each, therefore, should be taken separately. (2) To avoid repetitions in the statement of principles, the points are treated in a somewhat different sequence from that which should be followed in making the actual analysis. Chapter 5 suggested that the need for each *major function* and basically different ways of performing it should be explored before detailed operations are considered. In this chapter and Chapter 12, however, functions and operations are treated together as is indicated by questions 3, 4, and 5 above.

STRENGTHENING ACCOMPLISHMENT OF THE OBJECTIVE

Throughout the preceding chapters, we have emphasized the importance of improving the end results of a procedure before trying to reduce the clerical cost of carrying it out. Chapter 5 lists a number of questions illustrating the varied directions that this phase of the analysis might take. Chapter 9 outlines the steps to be taken during the procedures survey to determine what the objectives of the procedure really are and how effectively they are being achieved.

Following are three case studies that show the kind of broad-gauge thinking the analyst must apply to these facts if he is to make any real contribution to the strengthening of procedures as an administrative tool.

Case 1. Improving customer service. This study involves a company in the fastener industry that manufactures an extensive line of nuts, bolts, rivets, and similar items. Most such items are not protected by patents. Moreover, a company in the industry cannot maintain a significant product quality or price advantage, nor can it develop a brand-name franchise. Hence, one of the major factors affecting competitive strength in the industry is the quality and speed of service that a company renders to its customers.

Against this background, the company under consideration had experienced a sharp increase in the amount of overtime work in its order, traffic, and shipping departments. In seeking a solution to this problem, the procedures analyst assigned to the project recognized at the outset that any reductions he might make in clerical costs must not be achieved at the expense of service to customers. This meant that he would first have to determine the minimum standards of customer service that the company must provide to remain competitive.

In making this initial inquiry, the analyst found that over the past two years there had been a steady increase in (1) the average time necessary to process and ship a customer's order, and (2) the percentage of total orders that had to be filled by a series of partial shipments because some items were temporarily out of stock. Moreover, he found that a major reason for the increase in order-filling costs was the addition of three order expediters who were needed to make up for the deficiencies of cumbersome procedures and an organizational arrangement that involved six different departments in the order-filling cycle.

In light of these findings, the analyst was able to bring about fundamental changes in organization structure and order-processing and inventory-control procedures. These, in turn, produced:

1. A 55 per cent decrease in the average time required to fill an order.
2. A 68 per cent reduction in the volume of back orders.
3. An 82 per cent reduction in the volume of customer order-status inquiries and complaints about delivery service.

Case 2. Increasing the effectiveness of the sales force. A large insurance company, in the face of an increasing cost squeeze, undertook an extensive study to reduce or simplify paper-work activities in its many field sales offices spread across the country.

The first function that the study task force attempted to eliminate led to widespread and anguished protests by the company's agents, that is, its front-line salesmen. As a result, the task force backed off momentarily to think through more clearly what the real objective of its study ought to be. In making this reassessment, the task force recognized that the clerical units under study had two basic missions: (1) to render service to agents and (2) to render service to policyholders.

From this evolved the realization that before the task force could

make worthwhile and enduring changes in the character of the work being performed, it had to understand the real marketing significance of the services being rendered to these two groups. Specifically, what was the relative importance of each type of service in increasing the selling effectiveness of the company's agents? What parts of it were most productive? What parts were least productive and might be considered expendable? What wholly new services might be added to increase salesmen's productivity beyond the cost of such services? Similarly, what was the real nature and significance of service to policyholders? That is, what effect did each type of service have on policyholder receptivity to purchasing additional insurance or to keeping existing insurance in force?

From the field work undertaken to develop answers to these questions, the company was able, for the first time, to reach fact-founded decisions on which parts of the service were profitable and which were not. As a result, it eliminated services that had a relatively low payout and added some new services that helped agents materially without greatly increasing costs. The net effect was that the company substantially reduced the cost of running its field offices and, at the same time, maintained a high level of morale among its agents.

Case 3. Reducing inventories. In a large chemical company, the procedures staff was asked to make a study aimed at determining whether inventory records on maintenance, repair, and operating supplies should be converted to a punched-card method.

In evaluating the purposes that might be served by this method of record keeping, the analyst found: (1) that among the 37,000 items in stores were a great many similar items that served the same purpose; (2) that the average turnover rate on stores investment had declined in the previous three years from 2.3 times to 1.4 times per year; and (3) that over 20 per cent of the items in inventory had not been active (that is, no withdrawals had been made) in the past two years.

These facts led to the development of organization, policy, and procedural changes of the following types:

1. Reorganization of inventory records in such a way that departmental responsibility was clearly established for the size of the investment in each inventory class.
2. Establishment of planned dollar levels for each inventory class.
3. Inauguration of an inventory-standardization program aimed at

eliminating all unimportant or unnecessary variations in type, form, grade, size, shape, or material composition.

4. Organization of a continuing program for the detection and disposition of obsolete or surplus stocks.

Summary. These three case studies show how great an opportunity the procedures analyst has to increase business effectiveness by building better administrative tools. (Additional illustrations appear in the next chapter, which deals with the development of better management information for decision making and control.) Admittedly, the improvements that the analyst achieves in this area will not always be so thoroughgoing as the three described. Nevertheless, every procedure studied will offer some opportunity to strengthen the end product of clerical effort as well as to cut the cost of producing it.

MODIFYING EXTERNAL FACTORS

Chapter 5 emphasized that before studying the mechanics of the procedure itself, the analyst should attack the external factors that affect the volume or flow of work or the complexity of the procedure. These external factors are (1) organization, (2) policies, and (3) practices or performance of outside departments.

Organization. It is not intended to review all the principles of organization with which the procedures analyst must deal in his work but only to indicate some of the specific organization weaknesses that usually make for complexity of procedure. Following are the most common of these faults: (1) overorganization, (2) lack of clarity in the division of responsibility, (3) lack of standardization among like units, and (4) failure to delegate or to decentralize.

Overorganization. There is a tendency, particularly in the lower levels of clerical activity, to create an excessive number of separate organization groups—each performing a relatively small part of a single administrative process. The reason for this condition may be a desire either to achieve greater specialization or tighter control or to give a spurious form of recognition to individuals having long seniority or particular talents. Whatever the cause, the effects are often high clerical costs, cumbersome procedures, and dilution of responsibility to such an extent that accountability for results is lost.

To uncover a situation of this kind, the analyst should ask these

questions: How many separate organization units participate in the procedure under study? Is the number of people in each group fewer than one supervisor is capable of directing? How similar are the basic functions performed by these groups? Is there any overlapping or duplication of activities among them? Within each group, what is the ratio between time spent "making ready" or becoming familiar with each piece of work and the time spent on actual productive operations? How much time of each group is spent in recording documents passed along to the next unit and in following their subsequent progress through the routine?

Where this sort of probing reveals profitable opportunities to merge related organization units, some or all of the following benefits can usually be realized:

1. More flexible and economical use of the work force.
2. More economical supervision.
3. Concentration of responsibility for carrying out a procedure in a few key positions.
4. Acceleration of the whole procedure cycle through elimination of complex controls; extra handling, checking, and recording operations; and circuitous flow of work.

Lack of Clarity in the Division of Responsibility. Most of the problems caused by overorganization can also result from vagueness in the *division of responsibility* for carrying out the major elements of a procedure. This weakness has to do not with the structure of organization but with the day-to-day *working relationships* between departments participating in a single process.

The obvious results of failure to achieve a clear-cut delineation in this area are confusion, overlapping, duplication, and conflict. These conditions, in turn, produce more serious consequences. Important tasks are left undone or are poorly done because "everybody's business is nobody's business." Deficiencies develop in the service rendered to customers. Key decisions are made by people who have neither the information nor the point of view necessary to ensure the soundness of those decisions.

In the preceding chapter, the study of an order-processing, shipping, and invoicing procedure was used to illustrate the type of organization facts to be gathered during procedures surveys. Included in this list of information were the following questions: To what extent do sales headquarters, order, production control, or

manufacturing departments have direct contact with customers? What are the relationships between the order department and the sales department on determining the priority of shipments? What are the relationships among the sales, order, production control, and factory departments on establishing shipping dates, on determining the manufacturing sequence of orders, or on specifying the plant from which an order will be shipped?

These questions are also useful in illustrating the specific kinds of procedures improvements that can be achieved by straightening out problems of organization.

In studying the particular procedure covered by these questions, the job of evaluating organization relationships is largely one of ensuring that the following requirements are met:

1. *That fast, accurate information is given to customers.* This is difficult to achieve if customers have many points of contact with the company. For example, if, to expedite shipments, a customer communicates with the order and production departments as well as with the sales force, he is likely to receive conflicting information or inadequate attention.

2. *That decisions affecting more than one customer are made in the best interests of the company.* In times of short supply, for example, decisions regarding the priority of shipments vitally concern the sales department since they affect the whole selling strategy. On the other hand, if the volume of orders is large, the sales manager is likely to find himself overburdened with the routine work inherent in this function. A possible solution is for him to handle the activity on an "exception" basis by establishing policies governing the determination of shipment priorities. These policies, in turn, would serve as a guide to the order department in carrying out the detailed day-to-day scheduling of shipments. Any priority problem that could not be settled within the framework of these policies would be referred to the sales manager for decision.

3. *That decisions affecting manufacturing are based on all the facts important to the problem.* For example, if a given product is manufactured at more than one plant, decisions regarding the plant from which an order should be shipped affect that plant's rate of operation. Where such decisions are made by the sales or order departments, there is a danger that many essential factors will not be adequately considered, e.g., comparative unit production costs between plants at various levels of production, flexibility of the labor

force, desirability of maintaining relative stability of production at each plant over short periods of time, and so on.

These requirements are typical of those that procedures analysts must isolate and define in determining whether the existing division of responsibility is logical, workable, and well understood by everyone.

Lack of Standardization among Like Units. This is not entirely a matter of organization, for variations among like units may be found in the procedures followed as well as in the functions performed. Whenever an administrative process involves the flow of work from several similar units to a common point, the analyst should be on the watch for any lack of standardization that creates exceptions in the normal routine. Where he finds such variations, he will not always be able to bring about complete uniformity. Some differences in practice may be unavoidable. The great majority of them, however, are usually found to exist only because of tradition or personal preference.

Failure to Delegate or to Decentralize. A common organization fault resulting in procedure bottlenecks is the failure of executives to delegate authority for reviewing and signing documents covering routine transactions of the business. The analyst must seek to correct this condition whenever he finds that it seriously impedes the flow of work or decreases executive effectiveness.

A somewhat similar though less readily soluble problem is that of determining the degree of centralization or decentralization best suited to the performance of a given clerical function. Frequently, centralization (in a physical sense as well as in direction and control) is the more economical arrangement. In most cases where this is true, the reason is that the larger volume of work makes possible greater flexibility in the use of personnel, a higher degree of work specialization, less but higher-calibered supervision, and increased mechanization of clerical operations. It is also true that centralization produces tighter control and greater uniformity in the administration of company policies.

On the other hand, where a central group seeks to control the day-to-day activities of widely dispersed units, the result is not centralization but a costly hybrid of centralization and decentralization. Communication is either slow or expensive; work is delayed; and unless some duplicate records exist at both points, decisions or action must be based on insufficient information.

The advantages usually attributed to decentralization are that action is greatly facilitated and that decisions are sounder and more realistic because they are founded on a better understanding of local conditions and requirements.

Obviously, no one answer to this problem applies equally to all functions in one company or to any one function in all companies. One firm with 150 branch offices saved 20 per cent in the clerical cost of handling accounts receivable by centralizing this function in 12 of its branch offices strategically located throughout the country. Another company found it desirable, because of competitive service practices, to decentralize its accounts receivable operations to individual branches despite the fact that costs were increased 15 per cent.

The only general guide that can be given to the analyst is that, in tackling this organization issue, his objective should be to achieve the best over-all balance among clerical economy, control, speed, and service.

Policies. Second among the factors to be analyzed before the mechanics of the procedure are tackled are the policies that the procedure is designed to carry out. In this phase of the study, the analyst should look for two types of work-simplification opportunities.

1. Can the volume of clerical work be substantially reduced by making relatively minor adjustments in policy? For example, can pricing or discount policies be made more uniform without any significant loss of sales income but with a real simplification of invoicing procedures? In the routine for handling customer complaints, can a reduction safely be made in the amount of tracing to be done before settlement is made with the customers? In the accounts payable procedure, should the policy for handling overshipments, overcharges, or damage claims be readjusted? In many companies a large percentage of these discrepancies or claims represent dollar amounts smaller than the clerical cost of straightening them out. Can the volume of purchase orders be reduced by adopting a policy to issue blanket purchase orders to vendors from whom a large number of purchases are made? Can purchased items of low unit value be expensed at time of acquisition instead of being charged to an inventory account and expensed individually upon withdrawal from stores? One company found that 35 per cent of its stores requisitions covered items that represented less than 5 per cent of

the value of inventories. For many of these items, the clerical cost of maintaining continuous inventory records, pricing withdrawals, and charging them to jobs was greater than the value of the item itself.

2. Can the administration of existing policies be made more uniform so that exceptions to the normal routine are held to a minimum? As an illustration, the activities of the payroll department may be geared to carrying out an established policy for compensation of salesmen. But if sales executives are constantly making special arrangements for compensating individual salesmen, the payroll unit is forced to set up extra records and controls and to perform much of its work by nonstandard methods. This condition can often be corrected simply by making the executives aware of how frequently it happens and what effect it has on operating costs and speed.

Practices or performance of outside departments. The efficiency of a procedure is often influenced by the practices or performance of departments that play no direct part in carrying it out. For this reason the analyst must study these external factors in the same way that he evaluated the policies involved. Where he finds that the volume or flow of work through the procedure is adversely affected, he must look for opportunities to change the practices or improve the performance of these outside groups so that a better over-all result is achieved.

An illustration of this type of procedures analysis can be found in the experience of a company that attempted to cut clerical costs in its stock records, shipping, traffic, and invoicing departments. The persons making the study recognized at the outset that the volume of clerical work in these units was determined by the *number* of shipments made and not by the size of shipments. Although the company's total volume of business had increased only slightly in recent years, the number of shipments made per day had more than doubled and the average size of shipments had declined sharply.

The basic cause of this condition was the variance that had developed between delivery promise dates to customers and the dates on which merchandise was available for shipment. Some items were produced as much as three months behind schedule; others were correspondingly ahead of schedule. Thus, to avoid building up excessive finished-goods inventories, the company had resorted to hand-to-mouth shipping and back ordering.

As a result of this analysis, an intensive program was under-

taken to tighten the company's material procurement and production scheduling and control procedures so that output would be geared more closely to composite customer demand. When this had been achieved, the number of partial shipments declined sufficiently to permit a sizable reduction in the clerical force of the four departments originally surveyed.

REAPPRAISING THE WORK TO BE DONE

When these external factors have been fully explored, the analyst is ready to dig into the details of the procedure itself. Here his first step should be to determine *what work needs to be done.* This is a matter of analyzing critically each part of the procedure and of rooting out those parts that prove to be unnecessary or unprofitable. Elimination of this kind is the easiest and most obvious way of simplifying a procedure, and it sometimes accomplishes the objective of the study without further effort.

The raw materials for this phase of the development work are the statements of purpose or end use that were obtained during the fact-gathering process. Is the purpose of each function, operation, and document *justifiable?* How does each relate to the objectives of the procedure as a whole? Does it make a definite contribution to the quality or progress of the work? *Is the value of the contribution greater than its cost? What would happen if the step were eliminated or curtailed?*

These are the real tests of worth or need. In applying them to the existing routine, the analyst will profit by observing the following three rules:

1. Be sure that the attack is systematic and thorough. Test functions and major activities first. Then begin with the first step on the procedure flow chart and test each detailed operation.

2. Do not stop at discovering *why* something is done. Evaluate that reason. Find out if it is sound.

3. Take calculated risks. If the need for an activity or its profit-making value are uncertain, eliminate it—at least on a trial basis—and see what really happens.

As a further guide to the analyst, the remainder of this section contains a number of illustrations of the types of unnecessary clerical work that occur most frequently.

Unnecessary functions. Chapter 5 told how a mail-order house eliminated all shipping-paper files when it discovered that the cost of maintaining them was greater than that of replacing lost shipments. A more typical illustration is the failure to gear the billing and accounts receivable function to the payment practices of a company's customers. Even where customers ordinarily pay against individual invoices, some companies continue to render monthly statements of account which customers neither need nor act upon.

Unnecessary reports, records, and forms. Anyone who has ever looked into the use made of business reports knows how often they are continued long after their usefulness has passed. New reports are sometimes introduced without elimination of their predecessors. One department may discontinue use of a report without notifying the department that prepares it. Special reports requested to meet a temporary need may become assimilated in the regular routine and continued indefinitely. (Chapter 11 contains specific guidelines for testing the value of existing reports.)

The same mortality takes place in the use of forms and records but not necessarily in the documents themselves. Even when reports are discontinued, the underlying records are often kept "just in case" the reports are asked for again. Forms may be issued to carry out an activity which is so well known that the information contained in the form is not needed. An example is the issuance of operation sheets for jobs involving highly repetitive manufacturing operations.

Unnecessary *copies* of forms or reports are an even more common occurrence. Witness the company that maintains five complete invoice files, one each in the billing, sales, tabulating, accounts receivable, and adjusting departments. Three of these departments refer to invoices very infrequently and could quickly obtain whatever information they need by telephone.

This matter of unnecessary copies will usually repay searching study, for even where the cost of preparing the whole document cannot be saved, the cost of distributing, reading, and filing its copies may be substantially reduced. Usually these consequential costs are far greater than the initial cost.

An example of an unnecessary record can be found in the experience of a company that eliminated continuous inventory records by setting up a visual control over each stores item. Under this arrangement, the reorder point on each item is identified by (1) a

bin divider, (2) a line painted around the bin at the reorder level, or (3) the wrapping, taping, or sealing of the quantity representing the reorder point. In addition, at the physical location of each item involved, the company maintains a "traveling" bin card, on which are recorded:

1. The identifying number and description of the item.
2. Reorder point.
3. Reorder quantity.
4. Last invoice price.
5. Quantities received.
6. Physical inventory account.

This sort of record makes possible the pricing of withdrawal requisitions and the accumulation of usage history for setting reorder quantities. Through the adoption of this simplified procedure, the company was able to reduce its clerical storeskeeping costs by 40 per cent and still control inventory differences as adequately as it had under a more expensive system.

Superfluous data. Do forms, records, or reports contain more detail than is needed to serve their purpose? What use is actually made of each piece of information? Are money and quantity entered on stock records when only quantity is needed? Are figures shown in pounds and tons, in gallons and barrels, or in cases and dozens when either alone would be sufficient? Where sales-control records are maintained to show the volume of each customer's purchases, are postings limited to quantities shipped by product class? Or does the record contain such superfluous entries as customer's order number, date the order was received, shipping-order number, price, routing, car number, etc?

The amount of *unused* business information that is gathered, recorded, and reported staggers the imagination. In one company, a study of 17 forms, records, and reports prepared by a single department led to a 68 per cent reduction in the volume of information recorded. In another company, the number of entries on 11 monthly reports was cut from 995 to 281—a reduction of 72 per cent.

Situations such as these develop for a variety of reasons. The most common cause is carelessness in defining the specifications of a record or report when it is first set up. People just do not take the time to think through the limits of their purpose or to see that the information provided is restricted to their needs. In other instances,

the cautious operator plays safe by recording everything "just so it will be there if we ever need it." Another cause is the desire to maximize or justify the use of an expensive machine by turning out more and more information.

An important point for the analyst to remember in this part of the study is that the cost of recording superfluous data is not the only loss. If a report is cluttered up with a lot of unnecessary information, the recipients are likely to discredit it entirely with the result that the significant facts never come to their attention.

Excessive control. Does the procedure contain elaborate checks to detect errors that never occur? Is the amount of checking related to the risks involved? What control devices serve only to avoid or fix blame rather than protect against a real loss? Are unnecessary approving signatures required on forms?

These questions circumscribe the area in which calculated risks often produce big savings. Following are some specific illustrations of possible opportunities:

1. Can the cost of the credit function be reduced and the processing of orders speeded up by giving a list of approved credit risks to the order department?

2. Are orders registered for internal control when shipment is made within a day or two after receipt of the order?

3. How many approving signatures are required on purchase requisitions covering items for which reorder points and reorder quantities have been established?

4. On intracompany transactions, how careful a check is made of mathematical computations? For example, are extensions on labor and material charges recomputed when visual checking for proper placement of decimal points would protect against any serious error?

5. Are figures on reports being "balanced to the penny" when an over-all discrepancy of 1 or 2 per cent would not diminish the value of the information to management? For example, if the grand total of labor-cost distributions at the end of a pay period is within $100 of the payroll amount, would it not be safe to avoid locating the discrepancy?

Many such checking and control operations can often be safely eliminated. On the other hand, in his zeal for cost reduction and procedures simplification, the analyst is sometimes inclined to leave too few checks or controls where too many existed before. This danger can be minimized by applying such tests as these: What is

the company trying to protect against through the application of this control? What is the likelihood that (or frequency with which) this will happen? What are the consequences of its happening; e.g., what is the average amount of each loss likely to be?

A good illustration is the cost of checking customers' credit when orders are being processed. If the average value of customers' orders is $10, much less checking can profitably be done than if the average value is $1,000. Under the latter condition, bad-debt losses on a very small number of orders could quickly wipe out the savings gained from relaxation of control.

In general, the same method of evaluation should be applied to checks against clerical error. If some doubt exists about the probable volume of error, the person making the check should be asked to keep a temporary record of errors by type. In this way the cost of the control can be measured more precisely against the loss of money or time that would result from permitting errors to go undetected.

Where the need for some kind of check is indicated, two simplification possibilities still exist. These are suggested by the following questions:

1. Would a spot check rather than a check of every transaction be sufficient to maintain the standard of accuracy? As an example:

> Several of the nation's major domestic airline carriers are currently making settlements of interline passenger revenue payments based entirely on estimates made from sample information. The following facts indicate the importance of this statistical method of payment to the airlines:
>
> *a.* Annual interline passenger revenue billings between two typical large air carriers exceed $20 million.
>
> *b.* These billings are estimated monthly from samples that average 12 per cent of all interline tickets involved.
>
> *c.* Cumulative errors of estimating, running less than 0.1 per cent, are acceptable to both internal and public auditors.
>
> *d.* Clerical savings resulting from the sampling application can exceed $75,000 annually for any one of the large carriers. Annual savings for the total industry are more than $500,000.[1]

2. Can a substantial part of the checking be safely eliminated by verifying only those items that exceed a certain dollar amount? As an example, refer again to the experience of one company that gave

[1] W. C. Dalleck, "Inductive Accounting—Settling Interline Accounts by Sampling Methods," *Industrial Quality Control,* Vol. XIII, no. 6, December, 1956, p. 12.

up the checking of all vendors' invoices amounting to less than $50 each. (See Chapter 5 under "What Work Is Worth Doing?")

In evaluating the need for approving signatures as a prerequisite to action, the analyst should explore two points:

1. What is the nature of the control required? Is it a *qualitative* or a *quantitative* matter? For example, a personnel requisition is an instrument of quantitative control, since it is concerned with manpower requirements. An employment application, on the other hand, is primarily an instrument of qualitative control, since it is concerned with the selection of specific individuals. Are the approvals required on these forms related to the type of control to be achieved? Must an employment application, for instance, be approved by high-level executives who neither interview applicants nor are acquainted with the specifications of jobs to be filled?

2. What is the relation between approving signatures and other means of control over the same action? For example, are as many reviews and approvals of personnel requisitions needed where predetermined quantitative standards have been established and where some postaudit method of control exists (e.g., budget reports)?

Unnecessary refinements or quality requirements. Closely related to degree of control are standards of work quality and refinements of information. Are production orders completely retyped to make small amendments when a brief order modification form would suffice? On multiple-copy forms are typists permitted to X out mistakes rather than to erase them? Is it necessary to show cents in financial and operating reports? Can percentage figures be rounded out to whole digits so that calculations need not be made more than one digit beyond the decimal? Would an estimate serve where involved computations are required to develop more precise figures? For example, on purchased items, can the last invoice price or a standard price be used? This would eliminate the complicated calculations involved in using a first-in-first-out or an average-price basis for pricing disbursements. Can small charges for inbound tranportation be thrown into an overhead account so that they will not complicate the figuring of inventory unit prices? To reduce the amount of time required to reconcile clock cards with job cards, can arbitrary adjustments be made for discrepancies of a small fraction of an hour? Where indirect factory workers are performing a routine service function, can the accounting distribution of their wages be made weekly on a predetermined percentage basis rather than by

having them submit daily job cards charging their time to the departments they serve?

ELIMINATING DUPLICATION

While he is appraising existing functions and operations to determine what work needs to be done, the analyst should also be looking for evidence of work duplication. This is the area where, in all likelihood, he will find his greatest savings opportunities. Duplication is a hardy weed, and no field of clerical activity is without it. Businessmen talk about it continuously, they make sporadic efforts to uproot it, but still it flourishes. One of the reasons for its persistence is that it is often difficult to detect. It is like the weed that, to the inexperienced gardener, closely resembles the plant to be cultivated. In his search for evidence of duplication, therefore, the analyst should bear in mind the following two points:

1. *Duplication is partial much more frequently than it is complete.* Occasionally, to be sure, the analyst will find that the same thing is done in exactly the same way in two places. But usually he must go beyond that point to discover *overlapping* or *similarity* of activities, records, forms, or reports.

2. *Duplication may take several different forms.* It is not confined to the physical product of clerical effort. If the analyst is to dig out all the opportunities for work elimination or combination that lie in this area, he must look for duplication of (1) function, (2) purpose, (3) operation, and (4) information.

Duplication of function. An entire major function may be paralleled by a similar function in another division or even within the same division. As an illustration, the sales division may duplicate the work of the production control department by maintaining elaborate production progress statistics and by actively following up the factory to expedite customers' orders. Other illustrations were given in the section on analysis of the organization elements affecting the procedure.

Duplication of purpose. This is usually the most difficult kind of duplication to recognize, since activities having a common objective may be quite different in form. For example, in the study of a shipping and invoicing procedure, one may find that the order department sends the invoicing unit a copy of each production or shipping order issued. The shipping department, in turn, may number all shipped

orders consecutively and send one copy to invoicing where it is checked off a prenumbered register. In addition, the shipping department may send invoicing a daily manifest of shipments. Each of these different devices is nothing more than a way of protecting against failure to bill a shipment. Any one of the three should, by itself, provide adequate control.

Another common type of duplication of purpose can be found in reports that contain different information but are aimed at controlling the same activity. For instance, to facilitate control of overhead expense, the personnel department may be preparing manpower reports while the accounting or budget department is preparing operating expense reports. To control selling effort, the sales department may be building up summaries of orders as well as summaries of shipments.

Duplication of operations. Two routines containing similar operations often can be merged by retaining the necessary parts of each, eliminating the duplication, and reconstructing a single, simplified routine. For example, in the order-processing and invoicing routine, reduce to as few as possible the number of *product* "look-ups" that must be made throughout the whole cycle. Following are the principal reasons for making references to product records during this routine:

1. Verify or correct the product description, size, grade, or other specifications.
2. Assign correct product code numbers to the items ordered.
3. Price the order.
4. Deduct the items ordered from inventory records.
5. Pull prepunched product cards from a tub file.

Ideally, steps 1, 2, and 3—and occasionally step 4—should be combined into a single operation. Even the fifth item can be included if the tub file also serves as a continuous inventory "bank." Or, as an alternative, the order editor could pull product cards from a tub file, and the inventory record could be posted separately.

In his appraisal of the need for various control operations, the analyst very likely found more duplication of *checking* than of any other clerical operation. He may also have discovered that these extra checks pay for themselves—that the dollar value of errors caught is greater than the cost of catching them. But his search should not end there, for the pyramiding of secondary and tertiary controls is a costly and inefficient substitute for accurate primary control. He must find

out *why* so many errors are being made or *why* so many are getting past the initial checker. By learning the real causes, he will be able to suggest realistic corrective measures. Better training of the operator, simplification of the procedure, or mechanization of the operation will often reduce the volume of error to a point where double and triple checks can safely be eliminated.

Duplication of information. This is the most common type of duplication. Most business records, reports, or forms contain some information that has already been recorded elsewhere. Separate reports prepared for different purposes may be little more than different arrangements of the same basic information. They should be consolidated into a single new report that will satisfactorily serve all purposes. The same is true of forms and records, many of which are transcribed wholly or partially from other documents.

Particularly in studying forms and records, the analyst should learn to question all *copying* or *posting* operations, since they are duplication in its most elementary form. His objective at this point should be to reduce as far as practical the number of times any given piece of information is written. If one form is copied from another form, he should try to eliminate one by preparing additional copies of the other or to combine both in a redesigned form that will meet all requirements. Illustrations of this type of combination are contained in the next section. If a record is posted from a form, he should seek to eliminate the record by filing a copy of the original document in its place. In doing so, however, he must be careful not to create more work than he saves. A posted record can usually be referred to more quickly than a loose file or a binder of papers. On the other hand, 5 per cent usage would not repay posting 100 per cent of the transactions. The decision, therefore, should be based on the frequency of reference to the record, the cost of posting to it, and the time that would be lost in referring to source documents.

Where a record cannot be eliminated for practical reasons, an effort should be made to merge it with related records in the same or other departments. A typical example is the existence of many miscellaneous cost or expense records which are not properly tied in with the general accounting books. Consolidation of these data not only produces clerical economies but more meaningful information as well.

Figure 14 shows a useful device for uncovering duplication of information. The obvious advantage of this chart is that it enables the

Information Contained in Reports	Reports									
	Daily Tonnage Report	Daily Traffic Report	Bills of Lading	Weekly Inventory Report	Monthly Raw-material Inventory and Distribution	Monthly Production Reports	Monthly Report of Raw Materials Received	Monthly Plant Report of Shipments	Monthly IBM Report of Shipments	Monthly Returnable Drum Report
Cars Shipped		X	X							
Cars on Siding		X								
Finished Inventory, Product A				X		X				X
Finished Inventory, Product B				X		X				
Finished Inventory, Product C				X		X				
Beginning Raw-materials Inventory						X	X			
Raw Materials Received				X	X	X	X			
Total Raw Materials Used					X	X				
Raw Materials Used in Each Process and Each Product					X					
Ending Raw-materials Inventory				X	X					
Inventory Discrepancy					X	X				
Shipments of Product A	X					X		X	X	X
Shipments of Product B	X					X		X	X	
Shipments of Product C	X					X		X	X	
Number of Drums Returned										X
Number of Drums Destroyed										X
Number of Empty Drums on Hand										X
Number of Drums Outstanding										X

Fig. 14. Method of Analyzing Duplication of Information

analyst to record a great many related details on a single sheet. Particularly on major studies, therefore, its use will help to bring the full extent of existing duplication into sharper focus.

Combination of forms. Ideally, the form that initiates a procedure should be so designed that it will meet the requirements of all departments and eliminate the need for preparing other forms to carry out any part of the procedure. Where this ideal can be achieved, the cost of repetitious typing and checking of the same information is eliminated, the procedure cycle is shortened, and transcription errors disappear.

Following are six groups of forms, each of which illustrates the possibilities for accomplishing many purposes with a single writing:

Group 1

Sales order
Acknowledgment to customer
Register of orders
Shipping order
Shipping notice
Package labels
Packing slip
Bill of lading
Back order
Invoice
Register of invoices
Accounts receivable ledger

Group 2

Production order
Timecards
Stores requisitions
Purchase requisitions
Material identification tag
Cost accounting sheet
Inspection report

Group 3

Purchase requisition
Request for quotation

Purchase order
Receiving report
Inspection report
Material identification tag

Group 4

Paycheck
Payroll journal
Employee earnings record

Group 5

Interplant transfer
Shipping papers
Receiving papers

Group 6

Cash receipts journal
Deposit slip

In studying the procedure represented by any one of these groups, the analyst should ask: How many of these documents are now prepared separately? How much identical information is there among them? Can all or most of them be prepared in one writing?

The two most common ways of preparing multiple copies of a form are by reproducing them from various types of duplicating masters and by writing them simultaneously through the use of carbon paper. The latter method may involve the use of continuous forms, either with one-time or reusable carbon, or individual form sets with one-time carbons. In either method, spot carbon, strip carbon, block-out printing, overlay strips, long and short sheets, and other selective devices may be employed to prepare forms of different designs at the same time.

The choice between these two basic methods will depend on the number of copies required and on the amount of information that needs to be added or the changes that need to be made in the form after it has been initiated. A combination order-invoice form serves as a good illustration. If the order-shipping cycle is short, if few partial shipments are made, and if not more than about 10 copies are required, a multiple-copy, continuous-type form containing shipping papers and a fully priced invoice is probably best. On the other hand,

if information must be entered on the form by several departments, if back orders or order changes are frequent, or if the exact quantity to be shipped is not known until shipment has been made, a duplicating master is generally better because of its greater flexibility. For example, in reproducing copies from the master, the operator can clamp strips of master paper over the original master to add new or variable information. In this way, invoices covering back-order shipments can be prepared from the original master plus a special strip containing the invoice number and date, quantities, extensions, and total price of the most recent shipment.

On this whole matter of combining forms, one point of caution needs to be stressed: The analyst must be careful not to go beyond the point of diminishing returns. He must not fall into the error of seeking combination for its own sake, but only when it produces demonstrable savings or improvements. This is just another way of stating the important principle that duplication is not always avoidable or wasteful. In some situations it may be the simplest way of meeting the requirements.

Again using the order and invoice forms as an illustration, the analyst must be sure that the advantages of combination are not outweighed by the disadvantages. If the invoice copies cannot be prepared simultaneously with order copies, the advantages of a combination order-invoice duplicating master decline with a decrease in the average number of items per shipment. Thus, for example, to save a small amount of typing per invoice (masthead information and description of one or two items), the savings from the use of continuous-form invoices would be sacrificed and the time of reproducing invoice copies from the duplicating master would be added. In addition, it is often true that all routine work in connection with a combination order-invoice form must be performed more slowly because of the special care required in invoice preparation.

Check list of other work-combination opportunities. Following are a number of additional clerical activities to which the principles of work combination can profitably be applied. Once again the list is by no means complete, but, as a mental "pump primer," it should help the procedures analyst to think of still other areas that will repay investigation within his own company.

1. Can registers be eliminated by filing a copy of the original document in the same sequence as the register is maintained?

2. Are separate accounts receivable and credit records maintained?

3. Can postings to an accounts receivable ledger be eliminated by filing a copy of each unpaid invoice by customer name in an accounts receivable file? (This is a practicable arrangement only where customers normally make payments against individual invoices rather than against monthly statements or "on account.")

4. Can the sales journal be eliminated by filing invoices chronologically?

5. Can the posting, summarizing, and balancing of an accounts payable register be eliminated by sorting and totaling unpaid invoices by account number at the end of each month?

6. If cash tickets are being prepared for posting credits to accounts receivable, can this operation be eliminated by using customers' remittance checks as the posting media?

7. Are records designed to facilitate their use for more than one purpose? For example, if you have a returnable-container record, is it set up solely to establish customer accountability, or can it also be used as a control tool to increase container turnover? (The latter requirement is of particular importance when the annual depreciation per container is relatively high in comparison to the value of the product it contains.)

8. In building up statistical data, is the maximum use made at each point of subtotals developed elsewhere? For example, at sales headquarters, are order volume statistics built up from branch office summaries instead of from individual orders?

9. Has the maximum consolidation been achieved in the development of sales statistics by product, territory, industry, and customer? Have the sales information requirements of line sales executives been carefully integrated with those of the budgeting, market research, advertising, and production departments?

10. To facilitate the processing of sales orders, are all the fixed information and special instructions covering each customer contained in one record? Or must order clerks refer to files of previous orders or invoices?

11. Are these customer records maintained by sales headquarters and by the invoicing department as well as by branch offices?

12. Where addressing-machine plates or stencils are used to produce shipping labels, can routing instructions and special shipping or invoicing instructions be included on the plate or stencil?

13. Is a continuous order-backlog record maintained when this information could easily be obtained when needed by running a tape on unfilled orders?

14. Are orders being acknowledged in much the same fashion as they were 50 years ago when, under current procedures, the invoice itself is received by the customer within a day of the time that the acknowledgment reaches him?

15. Is there any duplication of order scheduling between the order processing, production planning, and factory departments?

16. Are continuous inventory records maintained in the storeroom as well as in the storeskeeping and accounting offices? At how many points are inventory money balances kept?

17. Are two postings for each transaction being made to finished-stock records—one when the order is drawn and the other when shipment is made?

18. Do production records maintained by dispatchers in the plant duplicate records in the production control office?

19. Can the dispatcher's work be combined with timekeeping?

20. Where machine hours are the controlling element in manufacturing costs, can the figuring of labor cost be eliminated by including all direct labor in burden?

21. If monthly maintenance costs are summarized by type of equipment as well as by department, can maintenance job orders be coded in such a way that one adding-machine tape will produce both sets of totals?

22. To eliminate the writing of individual purchase requisitions for items carried in stores, can a permanent "traveling requisition" card be adopted? This card would contain all fixed information about the item covered including name, specifications, code number, etc. Thus, in reordering the item, storeroom personnel needs to enter on the card only the quantity and desired delivery date before sending the card to the purchasing department.

23. Can the number of purchase orders be reduced by writing blanket monthly orders for items that are purchased frequently? Can purchase requisitions for similar items be accumulated for a week so that more items can be entered on an order?

24. Can a copy of each purchase order be filed by commodity to eliminate the posting of individual and cumulative purchase data to commodity records?

25. Are vendors' invoices checked by both the purchasing and the accounting departments? Are freight bills checked by both traffic and accounting?

26. Do both the personnel and the payroll departments maintain employee history records?

27. Can payroll and personnel records be combined? Or, at least, can much of the duplication between them be eliminated? One way of reducing the time required to maintain both records is to set up in the payroll department a payroll-change record on a translucent duplicating master. When a payroll-status change is entered on any employee's card, a duplicated copy can then be run off and sent to the personnel department to replace the superseded copy in its files.

28. Can the posting of employee earnings records be eliminated by filing a copy of each employee's paycheck or weekly earnings statement? Where this is done, the individual slips can be pulled and totaled as needed for government reports, compensation claims, etc.

29. Are various distributions or classifications of data being obtained as by-products of other procedures? For example, is the labor-cost distribution obtained as a by-product of the payroll preparation? Can distribution of data for sales-analysis purposes be obtained as a by-product of the accounts receivable procedure?

30. Can ledger entries of every type be made as carbon copies of journal entries?

31. Where intracompany forms are first written out by hand and then typed, can one or the other of these writings be eliminated? Can handwritten working papers be reproduced photographically to eliminate the typing of reports?

32. Can several rubber stamps be combined into one? If the form being stamped does not have sufficient space for the impression of a single, large stamp, can a slip containing the same impression be stapled to the form?

33. How many different serial numbers are assigned to a sales transaction before it is completed? Are there separate order, shipping, and invoice numbers? How many cross-reference records must be maintained because of these different numbers? Can a single numbering system be designed to serve all purposes?

34. Where the required number of copies of a tabulating-machine report is greater than can be prepared on the tabulator through the use of carbon paper, can the subsequent typing of the report be eliminated by running the machine report initially on a hectograph master? Or can still other methods of reproduction be used to avoid the copying of the original tabulating-machine run?

Chapter 11

STRENGTHENING MANAGEMENT REPORTS

Much of the work of every procedures analyst centers around the structure of recurring accounting and statistical reports that exists within his company. On some studies, his effort might be aimed at cutting clerical costs by reducing the number of reports. In other instances, his work might have been initiated by a complaint that management is not receiving its reports in time to be useful. Or, as still another alternative, he might be called upon to develop entirely new reports as changes take place in the character of the business or as new problems arise that require institution of new controls.

The full extent to which formal reports can occupy the attention of the procedures staff is underscored by the fact that the clerical force of any business engages in only two basic types of work. These are:

1. The *processing of individual transactions* (e.g., the preparation of a purchase order or an invoice, the payment of a vendor's bill, or the preparation of an employee's paycheck).
2. The *summarizing of individual transactions* for accounting and management reporting purposes.

It is not surprising, therefore, that the structure of formal information is a factor of great significance in modern business management. This is true partly because of the sheer cost of generating this information. Adrian McDonough, Director of the Taylor Management Laboratory at the Wharton School of Finance, says: "Half the cost of running our economy is the cost of information. No other field offers such concentrated room for improvement as does information analysis." [1]

[1] "Today's Office—Room for Improvement," *Dun's Review and Modern Industry*, September, 1958, p. 50.

But the cost of producing accounting and statistical information is not the key consideration. Of much greater consequence is the impact that these informational tools can have on management effectiveness. In large-scale enterprise, the structure of recurring reports comprises an important body of "intelligence" that management needs to operate the business successfully. As a result, much attention has been given in recent years to ways of rebuilding a vast assortment of traditional accounting and statistical reports into a compact, top-flight body of information that is easy for nonfinancial executives to understand and use. One measure of this attention can be found in the fact that one of the most heavily attended special conferences ever held by the American Management Association was devoted exclusively to the theme "Reports to Top Management."

THE CAUSES OF INTEREST IN REPORT IMPROVEMENT

We do not need to look far for factors explaining this interest that businessmen show in report improvement. Among them, the following three stand out:

1. *The long-term growth in size and complexity of many business organizations.* This trend has increased management's dependence on formal written summaries of operating results in place of the informal, on-the-spot observations or judgments made by managements of smaller businesses.

2. *The growing need for better ways of measuring executive performance.* This need, in turn, has been sparked by the high level of interest and activity in three major fields of management technique: decentralization of operations, management development programs, and incentive compensation for executives. Although each of these is very much a separate and distinct technique, all three have a common thread woven through them: to be fully successful in any situation, each requires the use of objective methods for measuring executive performance.

For example, if decentralization is to mean delegation rather than abdication, then the executive who used to "run the whole show" himself must learn instead how to evaluate the way someone else is running it.

Again, one of the key steps in many formal management development programs is determination of the profit-making components of individual jobs in order to help show executives exactly what is ex-

pected of them and in that way to build commonly understood bases for evaluating results achieved.

Finally, one of the most significant characteristics of successful executive compensation plans is that they achieve the maximum incentive or motivational value by ensuring that each person's incentive pay is a real reflection of his own performance. This, in turn, emphasizes the need for greater skill in measuring performance of the executive jobs to which the incentive plan applies.

Thus, all three of these techniques call for reevaluation of the structure of formal management control reports, for this is one of the principal means through which performance results are summarized, measured, and made known to those who must interpret them.

3. *The development of faster, larger-capacity, information-producing equipment.* With the expanding application of electronic data-processing equipment to business procedures, much attention is being directed at trying to identify faster and better ways of producing information for the control of operations.

As an illustration, in discussing his company's acquisition of a large-scale computer, an executive of a chemical company said, "We'll be happy if we break even on our EDP installation insofar as clerical cost is concerned. Our real purpose is to sharpen our management controls by speeding up the availability of existing information and by developing important additional information not now available." Another company stated its purpose as "the production of management information that will increase profits." Still another described its objective as that of "increasing the ability of management to make decisions sooner from more readily available and greater amounts of information."

There is no question but that electronic equipment (and, indeed, punched-card equipment) can produce more information faster than can be generated by any other means. But *because* this is true, one wonders whether our ability to generate information has not far outstripped our ability to assimilate it and use it intelligently in the running of a business. In any event, all levels of management face the persistent danger of becoming so fascinated by the lure of office automation that they lose sight of a far greater need to sharpen their skills in determining *what information is of real worth.*

This need is born of the fact that most managements are already flooded with too much information—a good part of which is of the wrong kind. And as a corollary—notwithstanding this enormous vol-

ume of information—some of the critical pieces needed for effective management of the business are typically missing.

As an illustration of the indigestible amount of information that can come into being, the president of one company was found to be receiving 125 different reports: 5 daily, 18 weekly, 54 monthly, 26 quarterly, and 22 annually. Considering the frequency with which each of these reports was issued, he received, on the average, something over 250 separate issues of reports each month. This meant that, if he spent 15 minutes on each one, over one-third of his time would be absorbed in this activity alone.

The economic waste resulting from too much information is primarily the loss of executive effectiveness that it causes, and only secondarily its incremental clerical cost. This loss of effectiveness comes about in either one of two ways, depending on how figure-minded a given executive is. He either ignores the great mass of information with which he is confronted (and therefore misses the vital as well as the marginal information) or he tends to become overburdened or even enslaved by it.

Despite this widespread problem, some persons still maintain that, in the past, management has had to act with inadequate facts and with many of the facts it did receive reaching its members too late. With the advent of the electronic computer, these persons contend that this problem will largely disappear, since managements will now be able to get all the facts they need and get them quickly. Hence, contend these proponents, the excuse for error in management judgment will be sharply reduced. As a consequence, the willingness of management to avail itself of these new information-generating devices will, as one person put it, "surely separate the men from the boys in commercial and industrial management."

This line of reasoning is based on the assumption that managements have always known what specific facts they need, but have simply not had the tools required to calculate and organize these facts in time to be of value or at a reasonable cost. One advocate of this point of view draws a parallel with another field of decision making by referring to similar problems that the meteorologist has faced in developing weather predictions. He points out that for some time enough has been known about the factors affecting the weather to make possible quite accurate predictions; the main drawback has been the tremendous amount of calculation involved, which formerly would have taken so much time as to make the prediction—once ob-

tained—of historical interest only. With the advent of high-speed computation, however, practical manipulation of the long-known facts has become a possibility.

The fallacy of applying this parallel to business lies in the assumption that we already know an equal amount about the factors affecting business growth, profitability, and competitive strength—and that, therefore, what now needs to be done is to determine how large-scale computers can be used effectively in doing the "tremendous amount of calculation involved" in collating this existing knowledge.

Unfortunately, the problem is not so simple. The real need in applying high-speed computers to the management of large-scale enterprise is not so much that of using such machines to manipulate existing knowledge as it is one of identifying much more clearly what are the factors that affect business health and in what specific ways or to what degrees each of these factors exerts its influence in any given situation.

This conviction is well expressed by Ralph Cordiner, who, as president of the General Electric Company, said: [1]

> It is an immense problem to organize and communicate the information required to operate a large, decentralized organization. . . . This deep communication problem is not solved by providing more volume of data for all concerned, by faster accumulation and transmittal of conventional data, by wider distribution of previously existing data, or by holding more conferences. Indeed, the belief that such measures will meet the . . . [management information] challenge is probably one of the great fallacies in business and managerial thinking.
>
> What is required, instead, is a far more penetrating and orderly study of the business in its entirety to discover what specific information is needed at each particular position in view of the decisions to be made there.

THE TOP-MANAGEMENT APPROACH TO REPORT IMPROVEMENT

This suggests that one of the surest ways in which the procedures analyst can apply the top-management approach to an important phase of his work is by making a fundamental attack on the whole management report problem, rather than merely by cleaning up existing reports one by one.

[1] Ralph J. Cordiner, *New Frontiers for Professional Managers,* McGraw-Hill Book Company, Inc., New York, 1956.

Most companies, at one time or another, undertake some kind of a "housecleaning" drive to straighten out their reports. But, all too often, the approach taken consists essentially of the following two steps:

1. Some of the most questionable reports are discontinued without notice and then reinstated only if the former recipients complain loudly and convincingly enough.

2. Copies of all other reports are gathered together and analyzed for duplication, following which the recipient of each copy is asked if he cannot get along without it. On the reports that have to be kept—and this typically includes over 95 per cent—further efforts are made to simplify the contents, rearrange columns, present some of the information in chart form, and the like.

This approach seldom produces any major, enduring benefits because it suffers from these basic defects:

1. It is self-limiting because it ties the mind to the make-up of existing reports. Its whole focus is on "scrubbing up" what the company now has.

2. It provides no reasoned basis for determining what information is needed. The principal criteria for cutting or keeping reports are personal preference and preconception.

3. It is not dynamic. It does not go deep enough in trying to rebuild the structure of management information into a real profit-making tool. It is a negative approach aimed primarily at cutting office expense through elimination of unnecessary or duplicate information.

In contrast to this typical approach, the job of report improvement should be regarded as more than just eliminating clutter and confusion from existing reports. This, to be sure, is part of the job. But the main objective should be to make certain that the report structure as a whole gives management the critical information needed for running the business and for determining how each segment is contributing to the company's over-all goals.

Against this background of problem and opportunity, the balance of this chapter is aimed at:

1. Providing a systematic basis for determining in any given situation what specific facts are needed by each level of management for intelligent planning and control of the results for which it is responsible.

2. Establishing the principles to be followed in building this information into a highly integrated structure of financial and operating

reports that are easy to understand, interpret, and use because they have been consciously designed for the user.

The beginning point in determining what reports are needed by management is to understand clearly what the basic purposes of reports are. As suggested by the schematic diagram appearing as Figure 15, these purposes are to facilitate the administrative processes of planning (which includes decision making) and control (which includes performance measurement). In addition to these two purposes, some reports in every business organization are prepared primarily to satisfy legal or government requirements. These are not treated here because they are not management reports, and because little, if anything, can be done by a single company to change them.

DETERMINING WHAT NEEDS TO BE PLANNED AND CONTROLLED

In light of these basic purposes, a fundamental approach to the building of a management-report structure begins with identifying—for the business as a whole and for each of its major segments—the kinds of decisions that need to be made and the important aspects of the business that need to be planned and controlled. This must be done in terms of (1) key financial variables; (2) factors governing success in that industry.

Key financial variables. These elements, which represent the components of the return-on-investment equation, include the following:

1. Sales volume
2. Product mix.
3. Selling price.
4. Costs.
   a. Fixed.
   b. Variable.
5. Capital investment.
   a. Facilities expenditures.
   b. Inventory.
   c. Other assets.

Since these variables are much the same in all make-and-sell businesses, the analyst's task here is to determine the significance of each in his company. This determination should cover the relative importance of each variable, the level at which it is influenced or con-

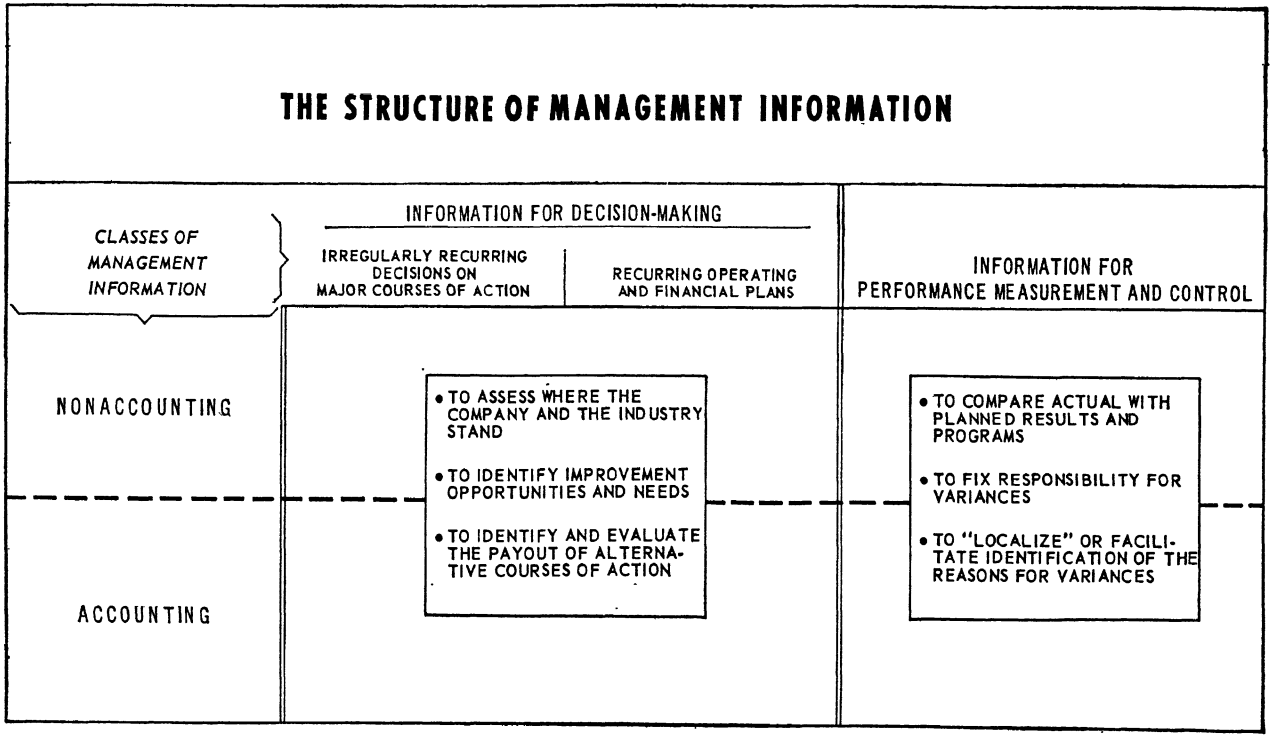


Fig. 15. Schematic Diagram of Structure of Management Information

trolled, and the detail in which it should be measured. For example, capital appropriation planning and control may be relatively less important in a pharmaceutical company than it is in others; whereas research and development expenditures may be relatively more important. Product mix of sales will be extremely important in some businesses; unimportant in others. In still other companies, competitive bidding practices and the variable of price can be among the most significant factors.

To illustrate this process, Figure 16 shows a list of the key financial variables for one company's marketing activities. This schematic diagram was developed from the attempt to answer these two questions: What are the basic elements of performance to be controlled in this situation? That is, what is the best indicator of over-all marketing performance? And what are the measurable or financial components that make up the total end result?

Critical nonfinancial factors. The next step in determining what needs to be planned and controlled is to isolate the critical nonfinancial factors on which success of the business depends. For any business—large or small—these will ordinarily consist of not more than four to six factors. They are the activities or aspects of the business that have a major impact, not only on short-term profit results, but also on long-term growth and competitive strength. As such they are the more important because they represent the only means through which the key financial variables just discussed can be influenced or changed.

Obviously, these factors (unlike the key financial variables) will vary widely from industry to industry. For example, in the automotive industry they include (but are not limited to) car styling and maintenance of a hard-hitting dealer organization. In the chemical business, the list of factors would include development of new products or new uses for existing products. For a distributor of major appliances, effective management of field inventories would be critical. For a life insurance company, the development of an adequate supply of competent branch or agency managers would be among the keys to success.

The story is much the same for other types of business, whether they be construction companies, savings banks, textile converters, public utilities, chain stores, newspaper publishers, or common carriers. For each such industry there is a relatively small handful of key factors controlling the success of any company. And for no two industries will this list of factors be exactly the same. Indeed, even

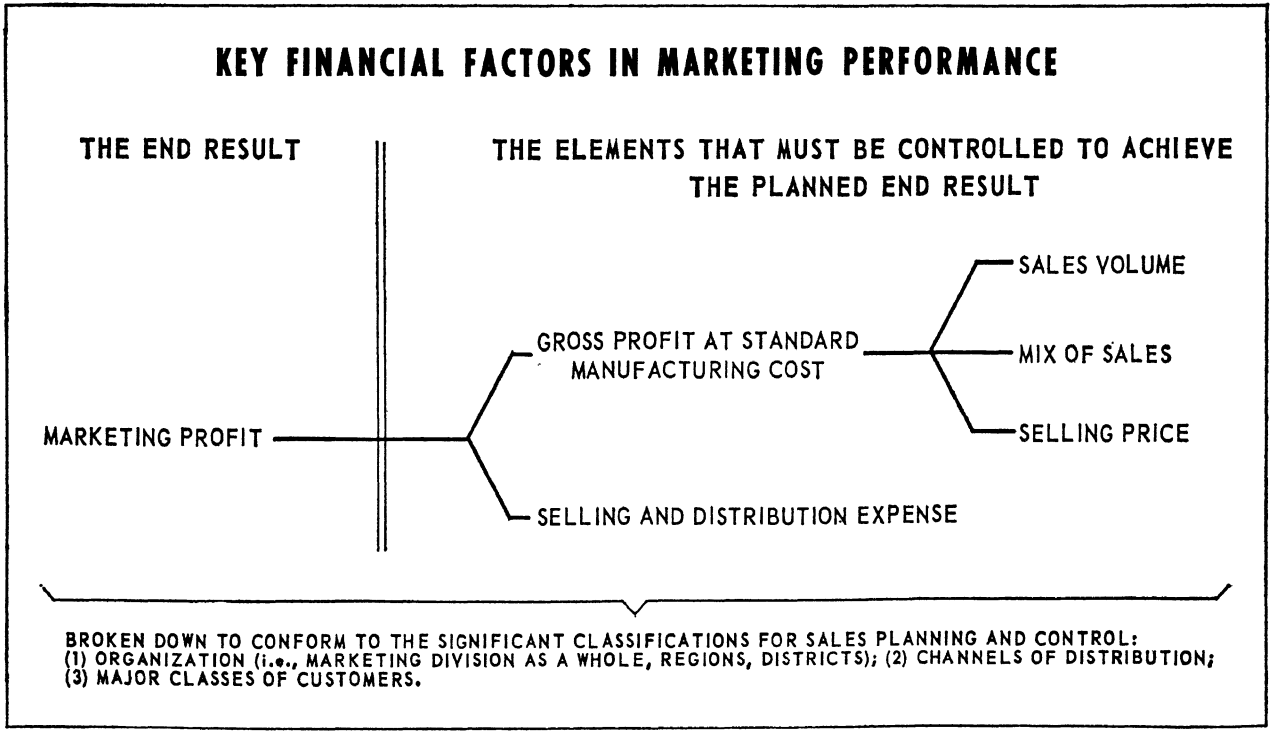


Fig. 16. The Key Financial Variables to be Planned and Controlled in One Company's Marketing Activities

within one company, the list of critical factors will vary from time to time with shifts in industry position, product superiority, distribution methods, economic conditions, availability of raw materials, and the like.

Because of these wide variances, all that can be done here is to suggest a way of thinking that should help identify these factors in any given situation. Specifically, the following questions should serve this purpose.

1. What are the things that have to be done well to make money in this business? Particularly, what must we do well today to ensure satisfactory profit results and competitive strength in the years ahead?
2. What are the unique strengths of the company's principal competitors?
3. What are the things that have to be done to increase sales volume? What are the ways in which a company in this industry increases its share of market? What impact on profits could each of these ways of growing have?
4. What are the major elements of cost and what are the ways of decreasing each?
5. For each of the major functional segments of the business, what are the key recurring decisions that have to be made? How much of an impact on profits could a good or bad decision in each of these categories have? In what way—if any—can the performance of this particular function give the company a competitive advantage?

Much of our focus thus far has been on the business as a whole. But, a very much similar approach or line of questioning can be followed to identify the factors governing the contribution that each department makes to the total enterprise. Specifically, the questions to be asked in this phase of the analysis are:

1. What conditions will exist or what results will have been achieved if the performance of this department is outstanding?
2. What are the things that have to be done well to achieve the kind of end result identified in the first step above?

As an example, this sort of analysis of the purchasing department in a large company emphasized the fact that only two of the major elements to be planned and controlled are covered by the company's accounting system: (1) the amounts of money paid for purchased components and materials and (2) the expense of running the purchasing department.

But because this company is essentially engaged in the assembly

of purchased parts and components, other elements of purchasing performance not reported in the accounting or budgetary control systems have a major bearing on short-term operating results. For example, through proper selection and follow-up of vendors, buyers can ensure the kind of delivery performance that avoids costly emergency purchases or production interruptions on the one hand, and excessive inventory build-ups on the other. Another example lies in the quality performance of vendors as measured not only by a low rejection rate but also by the avoidance of (1) difficulties encountered in using items that are accepted and (2) premature breakdown of the company's products after sale.

This analysis led to the following statement of performance factors for planning and controlling the company's purchasing activity.

Departmental operating costs:

1. Is the departmental budget based on up-to-date "engineered standards"? That is, has a comprehensive procedures and work-measurement analysis been made during the past three years?
2. How does actual departmental expense compare with budget?

Consequential costs and benefits:

1. Price performance: On key items purchased, have prices paid been consistently at, above, or below the market?
2. Results of purchasing research: What better or less costly substitute materials have been developed or savings opportunities uncovered through research into different purchase quantities, types of supplier, types of packaging, etc.?
3. Vendor delivery performance: Have delivery dates been secured from suppliers and how well have they been met? What have been the consequences of delivery failures?
4. Vendor quality performance: What have been the consequences of rejection or failure of purchased items—e.g., production interruptions, rework costs, and complaints or product returns from our customers?

THE KINDS OF INFORMATION NEEDED FOR PLANNING AND CONTROL

Once the major elements to be planned and controlled have been identified, the next step in a fundamental approach to management-report improvement is to determine the specific information needed for reaching decisions on and measuring performance of each element.

In carrying out this phase of the diagnosis, the analyst will find it profitable to think in terms of the basic characteristics of a soundly

conceived management-information structure as a whole, as well as the individual planning and control reports that it comprises. These characteristics are set forth in the three sections that follow.

The over-all management-information structure. A well-designed structure of management information as a whole has the following characteristics:

1. Focuses attention on the factors and elements of performance that control the end-result objectives of the enterprise. For business organizations these will ordinarily consist of profit results and share-of-industry position.
2. Provides to each executive and manager the information he needs for:
   a. *Planning* the end results for which he is responsible and the concrete action programs through which he will achieve those end results.
   b. *Measuring* his own and subordinates' performance and taking corrective action.
3. Recognizes that the kinds of information needed for decision making and planning are different from the kinds needed for performance measurement and control.
4. Is complete in the sense that it covers:
   a. Nonfinancial as well as financial factors and elements of performance.
   b. Long-term goals and programs as well as short-term ones.
5. Has an *operating focus* rather than an accounting and financial focus. This means that information exists not just because traditional accounting practices require it, but because it is specifically designed to help operating managers to do their jobs better.

Planning reports. The characteristics of a comprehensive, well-designed body of planning information are that it:

1. Is designed to help achieve the following purposes (which represent basic steps in the planning process):
   a. To assess where the company and the industry stand.
   b. To identify opportunities and needs for making basic improvements in over-all company performance or the performance of a given unit.
   c. To bring all units up to the level of the best.
   d. To estimate the payout of alternative courses of action (usually alternative uses for the available resources of manpower and money).

2. Is expressed in terms that make possible *meaningful* comparisons
   a. Between the current year's and prior years' performance of the same organization unit.
   b. Among like organization units (e.g., among branch offices, warehouses, plants, or operating divisions of the same company).

Control reports. In contrast to planning reports, well-designed management control reports have the following characteristics:

1. Follow lines of organization and are structured primarily to reflect the responsibility of individual positions. This means that the results reported should be segregated according to the individual most responsible for control over them.

2. Cover, for each separate organization unit of the business, all the important controllable elements of performance that affect the group's total contribution to company-wide goals. As a corollary, this means that allocated or prorated costs over which an executive has no control should not be combined in his reports with the costs over which he does have control. The surest way of avoiding this danger is to exclude all allocated costs from control reports. Where this is not possible, they should at least be segregated or earmarked to indicate that the executive is not expected to control them.

3. Facilitate evaluation of what has happened by measuring actual performance against what it should have been rather than what it was during a previous period. This means comparing actual results with planned results, not with past results.

4. Show causes of variances from planned results. Where possible, these causes should be isolated in the reported figures themselves. (This means, for example, that variances from planned marketing profit would be broken down to show the portion of the over-all variance caused by sales volume, mix of sales, selling price, and selling expense.) Where causes cannot be expressed quantitatively, they should be treated in an accompanying narrative explanation.

5. Represent an *integrated* structure in which the information furnished to all levels of management is tied together and simply becomes more condensed as higher levels of management are reached. This means that the control report structure ought to have unity. One should be able to follow logically and step by step from one report to another and from summary to supplementary or subsidiary reports.

6. Represent the "hard core" of information needed for performance measurement rather than a flood of information designed merely to keep everyone "informed."

7. Are consistent with the company's organization philosophy in terms of the positions to which reports are distributed and the amount of detail presented to each level of management. (Receipt of the same report by more than two levels of management—although not conclusive—at least points to the possibility of faulty distribution.)

8. Cover relatively short periods of time (e.g., one month) and are issued promptly enough to permit effective corrective action.

The distinction between planning and control reports. From the foregoing, two distinguishing features of control reports can be seen:

1. They compare actual performance with planned results or predetermined unit standards instead of with past-period results.

2. They cover relatively short periods of time so that corrective action can be taken promptly. Ordinarily the time span ranges from daily, for front-line control (of work spoilage, for example), to monthly for over-all control by higher levels of management.

On each of these two characteristics, planning reports differ materially from control reports. That is, to be really significant, the information needed in formulating operating plans and policies must cover comparatively long periods of time. Also, in planning reports, primary emphasis should be on the long-term trend of actual performance only. Thus, planning reports typically compare the results of the same organization unit or group of like units over a period of years to highlight such factors as growth or decline in industry position, profit margins, return on investment, and unit costs or productivity.

In summary, therefore, planning reports focus greater attention on historical performance in order to develop meaningful trend pictures. And they are usually not prepared or reviewed as frequently as control reports.

These distinctions are illustrated in Figure 17, "An Example of a Planning Report," and Figure 18, "An Example of a Control Report."

EVALUATING AN INDIVIDUAL REPORT

Up to this point the approach that has been outlined has been focused largely on the building of a model structure of management reports without too much attention to the details of existing reports. Even where this approach is followed, however, the analyst sooner

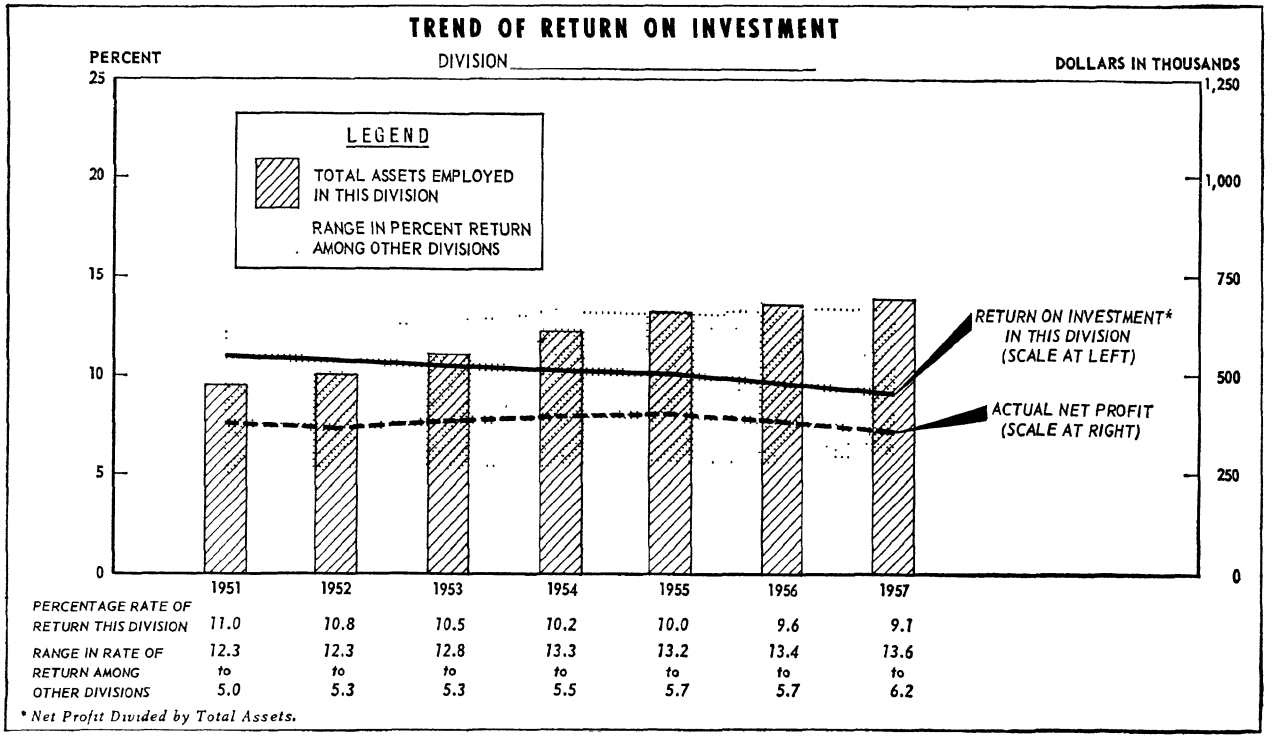


Fig. 17. An Example of a Planning Report

REPORT NO. A–1

SUMMARY OF ADMINISTRATIVE EXPENSE BY RESPONSIBILITY

(MONTH) (YEAR)

THIS MONTH					YEAR TO DATE			
EXPENSES		NUMBER OF EMPLOYEES			AVERAGE NUMBER OF EMPLOYEES		EXPENSES	
Over or (Under) Budget	Actual	Over or (Under) Budget	Actual	RESPONSIBILITY	Actual	Over or (Under) Budget	Actual	Over or (Under) Budget
				EXECUTIVE STAFF				
				CONTROLLER'S DEPARTMENT				
				PERSONNEL DEPARTMENT				
				OFFICE SERVICES DEPARTMENT				
				PUBLIC RELATIONS DEPARTMENT				
				PURCHASING DEPARTMENT				
				LEGAL DEPARTMENT				
				TREASURY DEPARTMENT				
				TOTALS				

DISTRIBUTION: *President and Controller.*

Fig. 18. An Example of a Control Report

or later will have to evaluate existing reports to determine what disposition should be made of them and how each relates to the model structure he is trying to build.

This is often a critical phase of his work because the proposed discontinuance of information now being received is much more likely to incite resistance than is the recommendation that new information be provided. The following series of questions suggests a way of probing deeply to get at the real worth of an existing report:

1. What specific decisions can be made or action can be taken on the basis of the information contained in this report? That is, if the results appearing in this report were significantly different from what was expected, what specific decisions would be called for or what action would be taken?

2. What is this report designed to *protect against?* That is, what could happen that this information is aimed at controlling? How likely is this to happen, and what would be the real consequences if it did happen?

The ways in which this line of analysis can help to get rid of some "sacred cows" is illustrated in the experience of a procedures analyst in a large industrial organization who was engaged in a study of the company's purchasing department. In the course of his work the analyst raised a question about a weekly report which was sent to the director of purchasing and which showed—for each of the six geographically dispersed purchasing departments reporting to him—the value of purchase orders placed during the preceding month, broken down by fifteen major commodity classifications. In reply to the analyst's question, the executive said, "Why, this is one of my most important reports. It shows me the volume of activity in each of the purchasing units for which I am responsible."

One important point to be recognized in this response is that the purchasing director did what is so commonly done in attempting to explain the purpose of a report. He did not, in fact, explain its purpose or end use at all. He simply redescribed the *contents* of the report. Or, stated another way, he said what the report told him, not what he did or could do with it.

Persistent digging by the analyst showed that the only conceivable purpose of the report was to determine when the volume of activity in each purchasing unit had changed sufficiently to suggest the need for changing the manpower complement of that unit. But the existing

report could not even serve this purpose well for the following reasons:

1. The manpower complement of a service unit like a purchasing department can ordinarily be adjusted only as longer-term changes take place in its work load. But the report under consideration contained no meaningful trend picture since it showed only the dollar value of purchases for the preceding month and the year to date.

2. The dollar information in the report was built up from vendors' invoices approved by these purchasing units for payment. Since, on many purchase orders, vendors' deliveries were made and invoices processed several weeks and often months after the purchase order was placed, the dollar figures in the report were not a good indicator of current work volume.

3. In addition, the dollar value of purchases is not the best measure of purchasing activity, since little more time is ordinarily required to purchase $500 worth of a given operating supply than to purchase $250 worth of that same item. For this reason, the *number of items* purchased—by significant commodity class—is a much better indicator of activity.

In light of this third conclusion, the analyst was able to point out that the various purchasing units were already maintaining statistics on number of purchase requisitions processed, broken down by commodity class. As a result, he was finally able to secure discontinuance of the report in question and to substitute for it a simple long-term trend chart showing, to the director of purchasing, the fluctuations in volume of purchase requisitions placed by each unit under him.

EFFECTIVE REPORT PRESENTATION TECHNIQUES

Once the report model has been constructed by this process of identifying the information needed to plan and control the critical elements of performance, the only task remaining is to use these basic raw materials in the design of finished reports. This is essentially a matter of arranging the desired information in a form easily understood by an executive who is not figure oriented. Admittedly, this is a matter of form and not of substance, but a great many business executives will testify that it has a major bearing on the usefulness of reports and, therefore, on the extent to which they are used.

Following are some guidelines that will help the analyst carry out this part of the report improvement program.

1. Be sure that every report is a simple and concise statement of only the pertinent facts so that the recipient can learn what he needs to know without being confused or without having significant information obscured by excessive detail. More specifically, here are things the analyst can do to avoid the "bed-sheet" type of figure reports that discourage management use:

a. Be sure that the amount of detail is limited to that which can be controlled. For example, reports for front-line sales supervisors do not need to show dollars as well as product units when prices are set by headquarters executives.

b. Eliminate all computed figures that may have been necessary to build up a schedule but are not needed to understand the end result.

c. Report only actual performance and variance from plans. To include the budget amount in the report serves only to complicate it and to divert attention from the important facts.

d. Eliminate cents and round large figures to the nearest thousand or million dollars.

e. Review the account classification or product breakdown to see whether they are producing amounts smaller than management needs to control expenses or sales results effectively.

2. Express every report in the language of the user. Be particularly certain to avoid technical accounting jargon, such as "burden variance debit." Also be sure that report titles, columnar headings, and item names or descriptions are so clear that no one *could* misunderstand them.

3. Use presentation techniques that highlight significant developments or out-of-line performance. The basic objective here should be to focus the reader's attention on matters requiring decision, action, or further investigation. This should be done by helping him to grasp the significant facts and relationships quickly without first having to engage in an extensive "mining" operation to extract the full meaning. This can be accomplished in several ways, the most common of which are as follows:

a. Compute and show deviations from plan (e.g., standards or budget) so that the reader does not have to make the calculations mentally.

b. If the significance of the data is not readily apparent to the executive who will use the report, then call his attention to the important facts or interpret the report for him. That is, if the report is not clearly self-explanatory, distill its significance for him. One

method of doing this is to red-circle the important variances. This is satisfactory where no further explanation is needed to make the report meaningful. Another technique is to provide a narrative interpretation, either in footnotes or in a supplementary report.

c. Use graphic methods of presentation wherever feasible—not only to reveal trends, but also to make the entire report easier to understand. Remember, however, that mere charting does not, by itself, ensure clarity. Like a statistical report, a chart that attempts to give too much information can be more confusing than helpful.

CONCLUSION

In the discussion of this approach to strengthening management reports, no suggestion is intended that any structure of information or system of control can replace the need for judgment, vision, resourcefulness, skill in motivating men, entrepreneurial drive, or any other executive quality. There is much evidence, however, that successful application of the approach outlined in this chapter will help to bring these executive qualities into fuller play by making executives better informed and by focusing their attention on the factors that have a major bearing on profit results.

To illustrate what can be accomplished by applying this approach, one company that used it was able to reduce its recurring reports from 560 to 140 and the number of copies of reports being distributed from over 2,800 to 460. An interesting sidelight is that the number of reports received by the president was reduced from 75 to 18.

But reduction in the quantity of information still was not the most important result achieved. The big gains—in terms of their bearing on management effectiveness—were scored in the quality of the information produced.

The president of the company put it this way: "I would guess that as a result of what we have done, almost 75 per cent of the figures have been taken off my desk. And yet, for the first time, we have confidence that all the important bases are covered and that we are getting the vital information we need to run and build our business."

Chapter 12

SIMPLIFYING PERFORMANCE OF A PROCEDURE

Once the water has been squeezed out of the procedure by the processes of elimination and combination described in Chapter 10, the analyst is ready to turn his attention to developing a simpler, faster, or less costly way of performing the operations that remain. This goal can be reached by all or any combination of the following means:

1. Developing a basically different way of performing an entire function.
2. Mechanizing the routine.
3. Adopting work aids.
4. Simplifying individual operations.
5. Changing the timing of operations.
6. Revising the office layout.
7. Redesigning forms.
8. Improving the filing system.
9. Improving the division of labor.

Developing a basically different way. As a beginning point in the exploration of different methods for carrying out an entire function, Chapter 5 suggested that the basic nature of the activity be described in as few words as possible. This is an important part of the diagnosis, for by first reducing an activity to fundamental terms, the analyst is likely to develop a more comprehensive list of the various means by which it could be performed.

As an illustration, the analyst may conclude that a given routine is essentially nothing more than classifying and summarizing numerical data—or "making a distribution," as the process is called in accounting terminology. (This is one of the most common of the

basic clerical processes, forming, as it does, a substantial part of all accounting and statistical work.)

By defining the activity under study in these simple terms, the analyst has opened the way to developing a complete list of possible methods. Assuming that he has had previous experience with this type of activity, he knows that there are only five basically different techniques for making a distribution:

1. *The Posting Method.* By this method, individual transactions are transcribed from source material to other sheets arranged according to the desired classifications (e.g., accounts, production jobs, product groups, etc.). Postings can be made either by hand or machine. Each class of data is ordinarily summarized as a separate operation.

The forms on which the entries are made may be either of two types:

a. Individual cards or sheets. Accounts receivable ledger cards are one of the most common forms of this type.

b. Columnar spread sheets. These contain a number of vertical columns, each headed by one of the classifications into which the data are to be segregated.

2. *The Peg-strip Method.* This technique permits data to be segregated into the desired classifications at the time they are originally recorded. The classifications are printed down the left side of a peg-strip form, and the entries are posted opposite them. In this way, several such strips can be shingled across a board and cross-totaled by classification. The forms are usually punched at the top so that a group of them can be held in proper alignment by metal pegs or rings.

3. *The Unit-ticket Method.* This involves creating a separate card, slip, or sheet of paper for each transaction. Data can then be classified by sorting unit tickets rather than by transcribing figures. The total of each classification is obtained as a separate operation after sorting.

Unit tickets may be created in a variety of ways. Each transaction may be originally recorded on a separate form. Documents containing several transactions (e.g., invoices covering more than one product) may be torn or cut apart to obtain unit slips. Or, unit tickets may be created from source documents as a special operation.

A similar variety of sorting methods may be used: manual sorting, either with or without such aids as sorting racks, leaf-type sorters, etc.; machine sorting of punched cards; and needle selection of spe-

cially created cards which have been grooved according to the classifications into which the data are to be segregated.

4. *The Exhaust Method.* This is really a variation of the unit-ticket method, since it consists of treating multiple-transaction documents as if they contained only one transaction. That is, the operator runs through a group of source documents adding all items of the same type. This process is then repeated until totals have been obtained for all classifications.

5. *The Machine-register Method.* Like the exhaust method, the machine-register method permits data to be simultaneously spread and summarized by classification. The operator punches source data into the keyboard of a multiple-register adding machine. She then depresses a classification key by which the figures are transmitted to the register reserved for accumulating that group of data. One or more conventional adding machines can also be used for this type of distribution simply by treating a given number of vertical rows of keys as a register.

With this list of alternatives before him, the analyst is now ready to consider the many factors affecting the choice of method for the particular routine he is studying. In this type of process, the factors to be weighed would, of course, include the volume of transactions, the number of different distributions to be made of the same data, the number of classifications within each distribution, the different forms in which data could be originally recorded, etc.

The important principle to be drawn from this illustration is that the analyst must be careful to avoid any preconceived ideas about the best method of performing a given function. If he is to choose wisely, he must make sure he knows all the methods that could be employed and considers each with an open mind, weighing its cost, speed, and accuracy against the requirements to be met.

Mechanizing the routine. Although mechanical methods will have been considered in the search for basically different ways, the mechanization of clerical work deserves separate consideration because of the important part it plays in the operation of most businesses. It is not intended to describe the many types of equipment applicable to common clerical operations but rather to establish some guidelines for determining whether a routine should be performed manually or by machine and, if the latter, what type, make, and quantity of equipment are most suitable. The basic principles involved in evaluating

automation alternatives are set forth in this chapter. Application of these principles to the evaluation of electronic computers and integrated data-processing techniques is covered in the two subsequent chapters.

In any study involving consideration of mechanical methods, the analyst should constantly bear in mind the following three principles:

1. Mechanical methods are not necessarily cheaper or faster than manual methods. Just because a given operation *can* be performed mechanically is no reason for doing it that way.

2. The choice of methods must be based on *what work needs to be done,* not on what a machine is capable of doing. This point may seem elementary, yet failure to heed it is probably the greatest single cause of unsound or unnecessarily expensive office-machine applications.

In witnessing machine demonstrations, office executives are too often influenced by feats of mechanical performance that have little relation to their own particular needs. They are unduly impressed by a machine's speed or capacity or versatility. They develop illusions about the value of new or additional information that the machine is capable of producing. These lures, when coupled with a pervasive desire to "be modern," induce in them what another writer refers to as "mechanical hypnotism."

The result is that a good many economic errors are made in the selection of basic methods. Machines are being used where simpler and cheaper manual methods could produce a less elaborate but equally satisfactory result. In other cases, the wrong kind of equipment is being used. A machine may have greater capacity than that required or it may have multiple functions, special attachments, or automatic features that cannot be fully utilized or that encourage the performance of unnecessary work.

An important point to be stressed in this connection is that an office-equipment salesman cannot be expected to figure out the user's requirements. The salesman's primary function is to make clear what his machine does and how it operates. The user must determine what information he needs and what his speed and accuracy requirements are. And he must reach decisions on these points *in advance* if he is to make any kind of a rational approach to the selection of methods.

3. Where certain operations are already mechanized, do not make the mistake of assuming that all possibilities for mechanization are exhausted in that particular area. One company, which had been pre-

paring its shipping labels for several years on addressing machines, discovered that it could make a 50 per cent reduction in the work force performing this operation simply by installing automatic paper-feed attachments on the machines. Labels were formerly fed through the machines by hand at an output of 800 per hour; the automatic feed increased production to more than 3,000 per hour.

Once clear decisions have been reached on the information, speed, and accuracy requirements to be met, the choice between manual and machine methods or between two types of machines should be based on the following factors: (1) comparative costs, (2) comparative speeds, (3) quality of the work produced, (4) flexibility of equipment, (5) ease of operation, (6) effect on the labor force, and (7) reliability of equipment.

Comparative Costs. This factor is usually considered first, since it is of primary importance and since many of the advantages of one method over another are reflected in their respective costs. The costs of a proposed machine method are made up of the following elements:

1. Recurring costs
   a. Labor.
   b. Machine rental.
   c. Machine maintenance.
   d. Operating supplies, such as printed forms, carbon ribbon, chemicals, film, electric power.
   e. Building occupancy or floor space.
2. Nonrecurring costs
   a. Machine purchase price depreciated over a predetermined period of years.
   b. Initial set-up and conversion costs amortized over the same period of time. These are the costs involved in making the study and in converting from the former method to the new method.

In contrast to these elements, the cost of a manual method is made up of labor, operating supplies, and space.

Of these various cost elements, labor is usually the largest and always the most difficult to determine accurately. The only precise way of measuring it is to list every detailed operation to be performed, determine the labor time required to do each, and extend that time by the hourly rate for the class of worker involved. This approach takes

time and effort, but the results are worth the expenditure. Too often this matter of labor cost is settled on no more substantial grounds than the assurances of an equipment salesman that his machine will "save the work of two people."

In using the approach suggested for determining comparative labor costs, the analyst must be careful not to attribute economies to the machine that in reality are a result of other procedure improvements developed simultaneously with the machine proposal. This is just another way of saying that the cost of a proposed new method should never be compared with the cost of the existing method unless the latter is known to be as simple and efficient as it can be made. In the design of a proposed new method, a number of short cuts and improvements in the present routine will have been worked out. Therefore, to make a sound cost comparison, the analyst should first achieve the maximum possible simplification of the existing procedure. By doing so, he may find that the alternative method, which appeared so attractive initially, would now be clearly uneconomical.

As a further guideline in comparing alternative methods, the analyst should remember that any proposed method that exists only on paper is always highly idealized. It seldom reflects the exceptions, the tributaries to the main stream of paper work, or the clerical mistakes and inefficiencies that are built into the cost of the present routine with which it is being compared. To avoid this error trap, the administrative vice-president of one company insists that the estimated costs of proposed methods and procedures be increased arbitrarily by 15 to 20 per cent before they are compared with present actual costs.

In computing the labor cost of an office-machine application, two additional points should be remembered: (1) Do not forget to include an adequate allowance for set-up or make-ready time. (2) In setting unit times for various operations, use practical operating speeds and not maximum machine speeds. If you do not know what speeds to use in your calculations, visit the display room of the equipment manufacturer, or his distributor, and try to arrange tests of operations similar to those in the procedure under study.

Most of the cost elements other than labor can be determined quite readily. The following suggestions will be useful, however, in making sure that all factors are considered. Occupancy costs need not be included in either set of figures unless the space requirements under one method vary substantially from those under the other. In deter-

mining the initial investment on which depreciation is to be computed, do not forget to include the purchase price of any stand-by equipment that may be required or the cost of any permanent alterations to the building, such as the erection of soundproof partitions. If you have any question about the rate of depreciation to use, consult members of the accounting or tax department.

Whenever any new method is being considered, whether manual or machine, the cost comparison should also reflect the nonrecurring expense of making the change-over. This should include such items as the conversion of records, retraining of personnel, etc.

Still another factor to be taken into account is the possible reduction in various hidden costs when mechanization saves the full time of one or more persons. Under this circumstance, the saving includes not only clerical salaries but also payroll taxes, insurance and pension benefits, etc. Where a sizable manpower reduction is possible, the savings estimate should also reflect some decrease in supervision.

As a final guideline in evaluating a proposed new method, the analyst should not be content merely with determining that the contemplated installation will, in fact, save some money. Rather he should express the estimated saving as a rate of return on the investment involved; that is, the annual saving in operating costs as a percentage of the one-time cost of purchasing the equipment and changing over to the new methods. Then he should ask, "How does this return compare with the company's demanded rate of return on proposed investments in new production facilities? When will this rate of return be realized?"

Comparative Speeds. Theoretically, variations in speed between two methods are reflected in their respective costs; for once the time requirement for performing a procedure has been established, the assumption is that either method will be manned and equipped to meet that need. Thus, even though the output per person is greater under machine than under manual methods, the required deadline would presumably be met under the latter by the employment of more manpower. This condition would, of course, show up in the operating-cost figures.

For two reasons, however, this line of reasoning does not always hold true: (1) There is a practical limit beyond which any manual routine cannot be manned without risking considerable idle time. (2) Not all activities can be speeded up simply by adding more

pairs of hands. An illustration is mailing customers' orders from the sales department to the plant as compared with teletyping them.

For these reasons, some consideration must usually be given to the speed of performance under each method. But the important point to remember is that speed should not be judged as a thing in itself but only in relation to the requirements to be met. If one method is faster than another but each is sufficiently fast, speed should be given little weight in the decision.

Quality of Work Produced. Under a machine bookkeeping method of posting, the automatic computing and printing of new balance figures are more likely to produce an accurate record than manual posting is. By reproducing successive documents from a single duplicating master, errors in transcription are eliminated. Thus, the quality of work produced is an important intangible in the choice of methods. This applies not only to accuracy of results but also to such other factors as appearance, completeness of information, etc. For example, operation sheets for a factory job might be printed mechanically either from punched cards or addressing-machine plates or stencils. However, the documents prepared by the latter method would ordinarily be more complete and understandable, since they would contain fewer abbreviations and more information than would be practicable to punch into tabulating cards.

Flexibility. How flexible will the machine installation be in handling peak loads? Is it apt to become a bottleneck because of a limited number of machines and trained operators when under a manual method the work could be broken down and distributed among many people? How likely are these peaks to occur and what will be their probable size? Are the machines sufficiently flexible to handle unavoidable exceptions to the normal routine? Under the various methods being considered, how much flexibility would you have in cutting the costs of the procedure involved if volume should drop sharply? How easily can typical requirements be met under each method? For example, in the use of various types of duplicating masters available on the market, how easy is it to add information manually, to correct the master, or to block out information in reproducing copies? If a major change should be required, how fast could it be made? As an illustration, how quickly could a general rate increase be incorporated in the master record from which payrolls are prepared under a punched-card or an addressing-machine method?

These are typical of the questions that might be asked to determine how quickly and thoroughly a mechanical method can be adapted to changing requirements.

Ease of Operation. How difficult the machine is to operate may have been reflected in the operating-cost figures; ordinarily the more specialized the skills required of the operator, the higher will be his wage rate. Aside from the cost aspect of this factor, however, the analyst should also consider the possibility of labor turnover and the time required to train new operators.

Effect on the Labor Force. How is the clerical force likely to react to mechanization of a manual operation? In weighing this factor, the analyst should heed its long-range implications more than its immediate ones. Most workers feel some momentary uneasiness about learning new techniques or some fear that mechanization means large-scale labor displacement. These reactions will soon pass, however, once the newness of the system wears off. The important question, therefore, is, "What attitudes will the operators have toward the new method when they become accustomed to it?" They may be neutral, favorable, or unfavorable. For example, some dissatisfaction may occur if noise or fatigue of operation are greater, if the worker's hands or clothing are soiled by inks or dyes used in the process, etc. On the other hand, workers will usually favor a new method that gives them a salable skill or eliminates some of the drudgery of highly repetitive manual operations.

Reliability of Equipment. Finally, in considering mechanical methods, try to find out as much as you can about the mechanical reliability of the equipment. If you have had no previous experience with the manufacturer's equipment, talk with other users about their machine breakdown experience and the promptness of the supplier's repair service.

Adopting work aids. Closely related to mechanical and electrical equipment are the special tools or work aids that can be developed to speed up clerical work or reduce errors. A number of these devices were mentioned in Chapter 9. They include such things as codes; tables; charts; visual reference panels; sorting or collating racks; counting or measuring devices; templates for performing or checking clerical operations; fixtures for positioning work, supplies, or other tools; etc.

Many of these items are not available commercially but must be specially designed to fit the particular need. For that reason

the analyst must rely largely on his own imagination and ingenuity and not on that of equipment manufacturers for improvement ideas of this type. As a guide, he will find that the best opportunity for using such devices arises when highly repetitive manual operations are performed in large volume. This kind of situation—particularly where sorting, computing, referring, checking, or stamping operations are involved—should be a signal to look for the possible application of special tools.

Simplifying individual operations. The procedure under review will already have been streamlined considerably by the steps outlined in Chapter 10. The policy or information requirements may have been simplified; the organization for performing the procedure may have been straightened out; unnecessary work will have been eliminated; and duplicate operations combined. Having determined the basic method by which the remaining work as a whole can best be performed, we are now ready to look for means of simplifying the essential operations individually.

The following list of questions typifies the kinds of improvements that this part of the analysis can produce:

1. Is the work of a department divided into many minor classifications each of which has its own special procedure? If so, operations can usually be speeded up, errors and training time reduced, and personnel used more flexibly by the adoption of one or a very few standard routines.

2. Can the originator of a form supply additional information that would speed up the work in other departments? For example, are sales orders prepared from or checked against customer master cards that contain all the customer information required by the departments that perform subsequent steps in the work cycle? If sales-analysis reports are prepared from key-punched cards, does the order clerk enter territory and customer code numbers on each order from his master card file?

3. Can terminology on intracompany forms be simplified and standardized so that each form is easier to use?

4. Can the posting of records be simplified by adoption of standard abbreviations?

5. Can the cost of wire communication among company offices be reduced by use of standard abbreviations or code words for long phrases that occur frequently?

6. Are multiple-copy form sets designed to facilitate preparation

of varying numbers of copies? For example, the sales invoices of a company with a large export business ranged from 9 to 18 copies each, depending on customer requirements and the country to which merchandise was shipped. Because of this variation, the invoicing clerks laboriously assembled the required number of copies and inserted carbons by hand. A sizable saving was realized by adoption of two one-time carbon form sets, one having 9 copies and the other 15. Under this arrangement the clerks could prepare the required number of invoices simply by adding a few copies to, or deleting them from, one of these standard sets.

7. Are form letters being used whenever possible in making routine requests, answering inquiries, etc.? For example, the use of a form letter requesting bids or quotations saves not only typing and proofreading time but also the time buyers spend in dictating, reading, and signing much of their correspondence. Another potential application consists of designing a preprinted check-off form to explain to vendors the reason for deducting any charges against them from accounts payable remittances.

8. Has a simple, uniform classification of commodities been adopted to serve as the foundation for all sales reporting and record keeping?

9. Are codes or other means of classification too large or complex? One company found that it had 56 code numbers to designate the type of order and 189 to designate the type of customer. After these codes had been materially simplified, the coding operation became a matter of memory rather than of constant reference to code books. Sales analysis information became more meaningful, too, because it was not broken down into so many minor classifications having limited significance.

10. Can your large suppliers be educated to prepare their invoices, packing slips, and shipping papers in such a way that you can process these documents more easily? Many companies will find that 12 or 15 suppliers initiate the bulk of their receiving, incoming inspection, and accounts payable paper work. Where this is true, clerical time can often be saved by giving each supplier a written explanation of the documents and information you need to handle his shipments promptly.

11. Have vendors been requested to indicate purchase order numbers on shipping papers? Also, to expedite the receiving process, have they been requested to number all cartons in a shipment in

numerical order and to indicate the carton in which the shipping papers have been placed?

12. Does the method of editing or "dressing" customers' orders slow down their processing? If a large quantity of special information must be entered, can this operation, as well as the subsequent typing, be speeded up by use of a supplementary order-information form on which the most common instructions are printed and need only be checked by the order editor?

13. Where sales orders are written in the field, can order editing at headquarters be reduced by training the originating personnel to use a standard form, uniform nomenclature, etc.?

14. Is every order sent to the traffic department for insertion of routing instructions or has this process been simplified by the establishment of standard routings for regular customers?

15. If the volume of customer inquiries about order status is large, can it be reduced by having the order department send field sales offices a regular report showing the extent to which shipments are behind schedule on each product?

16. Must every manufacturing order be self-contained or can files of design specifications, bills of materials, blueprints, etc., be maintained in the various shop departments? (This arrangement may not work satisfactorily where the volume of design or methods changes is large.)

17. Where manufacturing orders must contain a number of long, standard clauses covering such matters as testing and crating, use of substitute materials, inclusion of repair parts, etc., can the constant typing of this information be eliminated by the use of rubber stamps or duplicated attachment sheets?

18. To simplify the development of gross-margin figures by responsibility, can sales be costed out on an average-gross-margin basis rather than on an individual-invoice basis?

19. Since discrepancies among invoices, receiving reports, and purchase orders are one of the most time-consuming operations in the invoice verification process, have statistics been developed on the type and volume of discrepancies as the basis for a corrective program aimed at substantially reducing the number of errors?

20. To reduce payroll verification work, can a simple over-all check be made by accumulating payroll hours by rate and then extending each rate group?

21. Can distribution of maintenance and other service labor be

simplified by using an average or standard hourly wage rate, or by using a service-hour rate that represents the average hourly rate plus normal overhead of the maintenance or service department per labor hour? Under this arrangement, any unabsorbed balance might remain as a residual charge in the appropriate maintenance department or be charged to general plant expense.

22. Can time reports covering salaried personnel be limited only to those employees who have worked more or less than the regular schedule of hours?

23. Can the errors in accounting work sheets be more easily detected by the development of a standard list of checking operations arranged in a sequence that reflects the probable frequency of error?

24. Does the invoicing procedure take advantage of the following opportunities to simplify invoice pricing?

a. To avoid chain-discount computations, print the price list or price book at the amount actually charged to the customer (that is, on a net-after-discount basis). Where this cannot be done, at least simplify the extension work by having a table of chain-discount equivalents.

b. On package merchandise, print prices according to the unit of sale (package size) rather than by weight (e.g., ounce, pound).

c. Precalculate prices for quantities frequently ordered and enter them in the price book.

d. If a great many items in the product line have the same unit price (e.g., paints of different colors), combine them into a single class on the invoice and make only one price extension for the entire class.

25. Is report information standardized for economy and ease of consolidation at higher levels? Are the chart of accounts and methods of recording basic data designed to facilitate the preparation of reports? Could the cost of preparing a report be reduced by changing the underlying records or source documents or the manual or mechanical methods employed?

Changing the timing of operations. While the analyst is studying the method of performing individual operations, he should also think about their *timing*. This element has the following three parts: (1) the sequence of operations, (2) their frequency of performance, and (3) delays in the flow of work.

Sequence of Operations. The speed or cost of a procedure can be greatly affected by the order in which its individual steps are

performed. A poorly planned sequence may result in extra work or more waiting time between operations. It may require the redoing of work that was initially done too early in the routine. It may mean costly rehandling and shuttling of papers back and forth among the clerks. Or, it may increase the total time spent on make-ready and put-away work.

The following list illustrates each of these dangers and suggests a number of ways in which they can be avoided by changing the sequence of operations.

1. Is the timing of checking operations so determined that the number of checks is held to a minimum? For example, in invoice preparation it is customary to recalculate extensions and totals as a check on the original computations. If this check is made against the invoice work sheet instead of the typed invoice, then the invoice must be checked separately for typographical errors. But, by recalculating extensions and totals on the finished invoice, the checker picks up both computing and typing errors in one operation.

2. Where speed of processing is paramount—as it might be in the development of cost estimates for a bid or price quotation—are enough copies of the initiating form prepared so that the various operations can be performed simultaneously rather than consecutively?

3. Are expensive means of communication being used when, by changing the sequence of operations, less costly means would serve as well? One company spent several thousand dollars a year telegraphing notices of shipment and freight-car numbers to its customers. Each of the company's Middle Western plants air-mailed a daily list of its shipments to the company's sales headquarters in an Eastern city. From these lists, sales personnel, in turn, sent telegrams to its customers. After several years this practice was changed, and the expense of wiring was saved by having the plants air-mail shipping notices direct to customers on the day shipment was made.

4. Is there any avoidable backtracking of work? At how many different times does each person handle a given document? If more than once, can all the operations of each person be performed in an unbroken sequence? If not, can some operations be reassigned to prevent backtracking?

5. Is sorting being done at the wrong time with the result that the sort must be destroyed to perform an intermediate operation and

then re-created? Particular attention should be given to the scheduling of this type of work, for sorting more than once to the same classes of data can usually be avoided by a different sequence of operations.

6. Are reports prepared in the sequence that makes possible the use of summaries developed in one report as the starting point for another? Here the purpose should be to reduce to a minimum the number of reports that require going back to the original media (source documents or detail cards) to build up summary information from the beginning. For example, if product sales must be summarized by individual customer, can the results be posted to a peg strip and then crossfooted to obtain product totals by salesman?

7. Are forms being inserted in typewriters at more than one point in the procedure cycle when all the required information could be entered during the first insertion?

8. Where shipments are made from stock, are stock records referred to at the right point in the procedure cycle so that subsequent clerical work is minimized? For example, if limited quantities are carried in stock, the stock record should be checked for availability of the items ordered (and the withdrawal posted to the record) before the order-invoice form is prepared. In this way, the need for retyping incorrect invoice forms will be eliminated. On the other hand, if out-of-stock items are few in number, incoming orders can be scanned for these items and, where found, they can be back ordered. Thus, stock records need not be posted in advance of order filling or invoicing. At the end of the day, all invoices can be summarized by item, and a single withdrawal entry, instead of many, can be made to the card covering each item shipped. Where invoices are summarized daily to get product sales figures, these totals can also serve as summary postings to the stock record.

9. Can shipments be speeded up by sending a copy of each order to the shipping department before the merchandise arrives from the stock room? Where this is done, the shipping crew can usually schedule its work better and prepare for any special packing or crating requirements in advance.

10. Can physical inventory verification be simplified by inventorying each item at or near its minimum level?

11. Can the sequence of steps be changed so that related operations can be combined, thereby reducing make-ready and put-away time? Coding, for example, though usually performed separately, might easily be done during some other operation where the worker

has to refer to a file or record suitable for carrying the code numbers. This technique of combining essential operations through changing their sequence can be widely applied and should be kept in mind as individual operations are studied.

Frequency of Performance. In addition to asking, "Is the operation performed at the right time in the procedure cycle?" the analyst should ask, "Is it done more often than necessary?" This type of inquiry may lead to curtailment of work, even though the operation itself cannot be eliminated. Following are six examples of this type of simplification:

1. In one company, each time a manufacturing blueprint was required by a shop department, reproduction-machine operators removed the appropriate tracing from their files, put it through the machine to make a single print, and refiled the tracing. Analysis showed that 45 per cent of the prints requested were reproduced from only 6 per cent of the tracings, and that on any given part or subassembly as many as 12 prints might be needed within a three-month period. On the basis of this study, quantities of prints to be carried in stock were established for the most active parts. This materially reduced the frequency of reproduction on many tracings and saved a good bit of make-ready and put-away time.

2. The physical inventory verification process can often be simplified by counting each inventory item only once a year (or only as often as is necessary to keep reasonable control of stock through reconciliation of physical quantities with detailed records and dollar control accounts).

3. In the maintenance of continuous inventory records, the common practice is to compute and enter a new stores balance each time a withdrawal entry is posted to the record. Yet some companies find that clerical labor can be saved by limiting withdrawal postings to date, requisition, and quantity, and by computing a new stores balance only after 10 or 12 such entries. (Balances are figured more frequently, of course, when the reorder point is being approached.)

4. A heavy equipment manufacturing company that received most of its inbound shipments on a freight-collect basis set up an imprest fund with each of its principal carriers and reimbursed this fund on a biweekly basis to avoid daily payments of freight bills.

5. In the accounts payable process consider establishing specific dates such as the tenth and twenty-fifth of each month for paying nondiscount invoices. This permits an accumulation of invoices for

individual vendors and reduces the total number of checks that must be written.

6. A final illustration of this type of change is a reduction in the frequency of report preparation. Can some information that is asked for weekly be prepared monthly, quarterly, or at irregular intervals and still serve the purpose adequately? This question may well have been raised during an earlier part of the diagnosis, for when the analyst asks, "Is this report necessary?" he presumably would also ask, "If it cannot be eliminated, does it need to be prepared so often?"

Delays in Flow of Work. The various types of procedure improvements already discussed in this and the preceding chapter will help, of course, to accelerate the whole procedure cycle. However, after the analyst has completed the processes of eliminating or combining work, developing better methods, and improving the sequence of operations, he may find that the procedure still has not been speeded up sufficiently to satisfy the requirements. This is particularly apt to be true where the procedure must meet a fixed deadline or where delays mean a direct loss of money. Examples are (1) the payroll procedure; (2) the receiving, inspection, and accounts payable routines, which affect the earning of time discounts on suppliers' invoices; and (3) a production planning system which depends on fast summarization of customers' orders as the means of minimizing finished-goods inventories without impairing customer service.

When the need or opportunity for faster action still exists at this stage of the analysis, the best approach is to chart the whole procedure backward from the deadline date to determine where the real delays are occurring and when each part of the process must be completed if the over-all deadline is to be met. Here are some of the additional short cuts that the analyst should look for in making this diagnosis:

1. *Reduce storage or waiting time.* In any procedure, the time that a document lies around awaiting work is usually much greater than the actual processing time. These so-called "storages" should be studied to see if they can be reduced by moving the work between desks or departments more frequently and in smaller batches.

2. *Eliminate bottlenecks.* If any obstruction exists in the flow of work after the procedure has been simplified and the methods improved, the cause of the bottleneck is likely to be poor distribu-

tion of manpower among the various jobs, insufficient equipment, or irregular work requiring special treatment. Where routine transactions are being slowed down by nonstandard ones, a possible solution is the setting up of a separate group to handle only the latter type of work.

3. *Eliminate peak loads.* Two outstanding examples of how peak work loads can be reduced are the cycle billing plan, which has been adopted by many department and specialty stores, and the common industrial practice of preparing factory and office payrolls at different times of the week. Another example can be found in the practice of cycling voluntary deductions from payroll checks in each of the first four weekly pay periods of each month, to reduce the peak load of handling all such deductions in a single week. Thus, union dues might be deducted the first week of each month, a bond deduction the second week, and so on. Still another illustration lies in the scheduling of purchase requisitions by inventory classes throughout the weeks of each month as a means of spreading the purchasing work load more evenly.

These techniques of staggering work have wide application and should be explored whenever a group's volume of work fluctuates heavily during the week or month. Where work peaks cannot be leveled by this means, their unfavorable effects might still be minimized by such measures as the following:

a. Cross training of personnel where different activities have peaks at different times.
b. Postponing work that can be delayed (e.g., filing, replenishing tub files).
c. Using part-time help on peak days.
d. Using outside service bureaus.
e. Staggering work hours during the day, e.g., from 7:30 A.M. to 6 P.M.
f. Letting backlogs accumulate on some of the less urgent work.
g. Offsetting overtime work on some days with time off later in the week.

4. *Advance the cutoff date.* One way of speeding up month-end financial and management control reports is closing the accounting books more promptly. This might seem to accomplish little since the elapsed time between the cutoff and the availability of reports would not be shortened. Both steps would simply be moved for-

ward by the same number of days, and those days' transactions would be held over for the next month's reports. Many companies will find, however, that although the great bulk of their transactions are recorded within a few days after the close of the month, their books are being held open for several additional days only to pick up stragglers. These are usually not large enough in volume to affect the reports. By holding them over until the next month, control information can, in fact, be given to management more promptly.

5. *Perform part of the work ahead of schedule.* Month-end reports can also be speeded up by doing as much preparatory work as possible before all the figures are available. If the reports are prepared from punched cards, some preliminary sorting, collating, or card reproduction can often be done toward the end of the month. Some accounting entries, such as depreciation, insurance, weekly payrolls, and other accrued expenses, can be disposed of before the other closing work begins. Parts of report forms can usually be filled out in advance. These include columnar headings, product or department names, profit-and-loss or balance-sheet captions, and figures used for comparison with actual performance.

In employing these and other measures to speed up the flow of work, the analyst must be careful that the increase in speed does not cost more than it is worth. In general, the faster work flows through a procedure, the smaller are the backlogs of work at any point. And, the smaller these backlogs become, the greater is the risk of incurring idle time because of lack of work. The analyst's job, therefore, is to achieve the proper balance between these two conflicting forces.

Revising the office layout. The *number* of times work moves from desk to desk and from department to department will have been reduced by the organization changes and the work elimination or combination already discussed. Thus, having determined what the essential moves are, the analyst must now see what can be done to shorten them. In other words, he must try to cut down the distance traveled by the work and by the workers through revising the office layout. This is, of course, not the only objective of layout studies. Others may include conservation of space, increased supervision of the work force, isolation of noisy equipment, better natural lighting, etc. But ordinarily the analyst's principal purpose in rearranging the layout is to speed up the flow of work

through the routine and to reduce the time lost by workers in moving about the office.

The steps by which this objective can be achieved are:

1. Eliminate crisscrossing and backtracking of work.
2. Locate each worker as close as practicable to:
   a. The person from whom he receives his work.
   b. The office machines, reference facilities, or files that he must use or the persons whom he must consult in performing his duties.
   c. The person to whom he gives his completed work.

Figure 19 illustrates the application of these steps to an actual layout. By comparing this "after" chart with the "before" chart of the same area on page 172, the reader will see how much movement can be eliminated by rearrangement of facilities. The flow lines on both charts show that in the processing of a typical complaint, the distance traveled has been cut from 277 to 182 feet, or a reduction of approximately 35 per cent.

The same techniques of charting and analysis can profitably be used in making departmental location studies. Figure 20 shows in graphic form the volume of interfloor personnel traffic within the office of a company occupying a multistory building. The study revealed that during an average week, about 1,300 personal contacts were made between individuals of two departments. Of these contacts, about 900 or almost 70 per cent were made between floors, from one to eight floors apart.

On the basis of this analysis, the company gave up its space on one floor of the building, acquired additional space on another floor, which it already partially occupied, and made a number of changes in the location of various departments.

The combined effect of these changes was to reduce the number of interfloor contacts by 65 per cent. Moreover, the new arrangement helped to improve interdepartmental coordination by facilitating important contacts that had been neglected in the past.

Redesigning forms. The next step in the improvement program refocuses attention on the printed forms used in the procedure. When this point is reached, the analyst will already have determined what existing forms or copies of forms or information on forms can be eliminated. His remaining job is to improve the design of the essential forms in a way that facilitates their preparation and subsequent use.

The design of every form has an important effect on the time required to fill it out initially, to distribute it, to add information to it, to transcribe information from it, to interpret it, to file it, and to find it. The number of minutes saved in processing a single copy of any given form might not seem consequential, but one has only to think of the

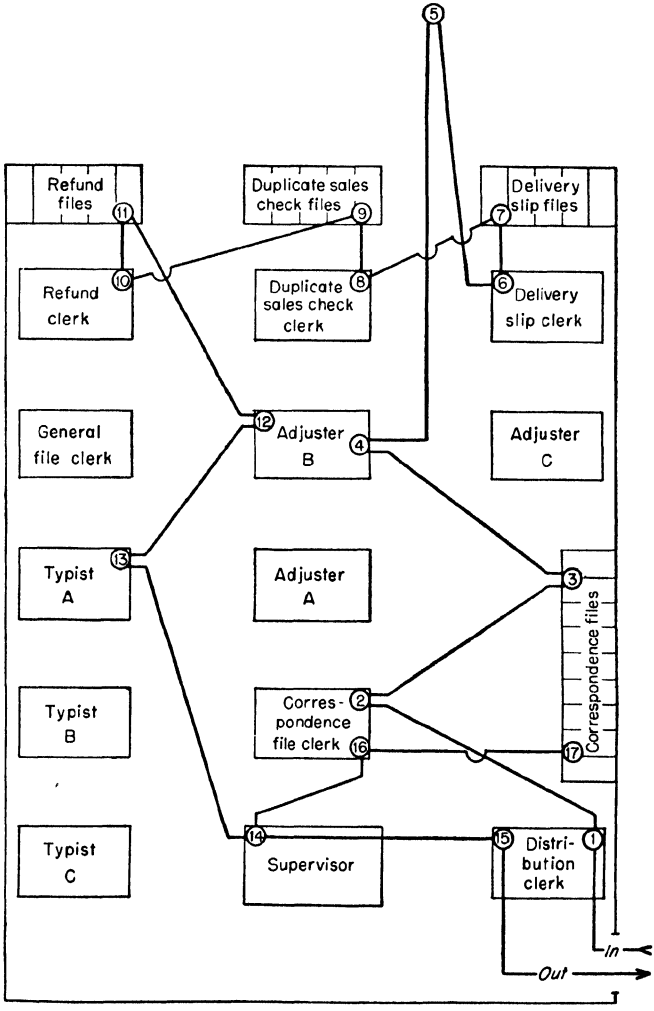


Fig. 19. Layout Flow Chart of Complaint and Adjustment Department after Rearrangement of Layout

tremendous volume of paper work in his business to realize what a cumulative impact better forms design can have.

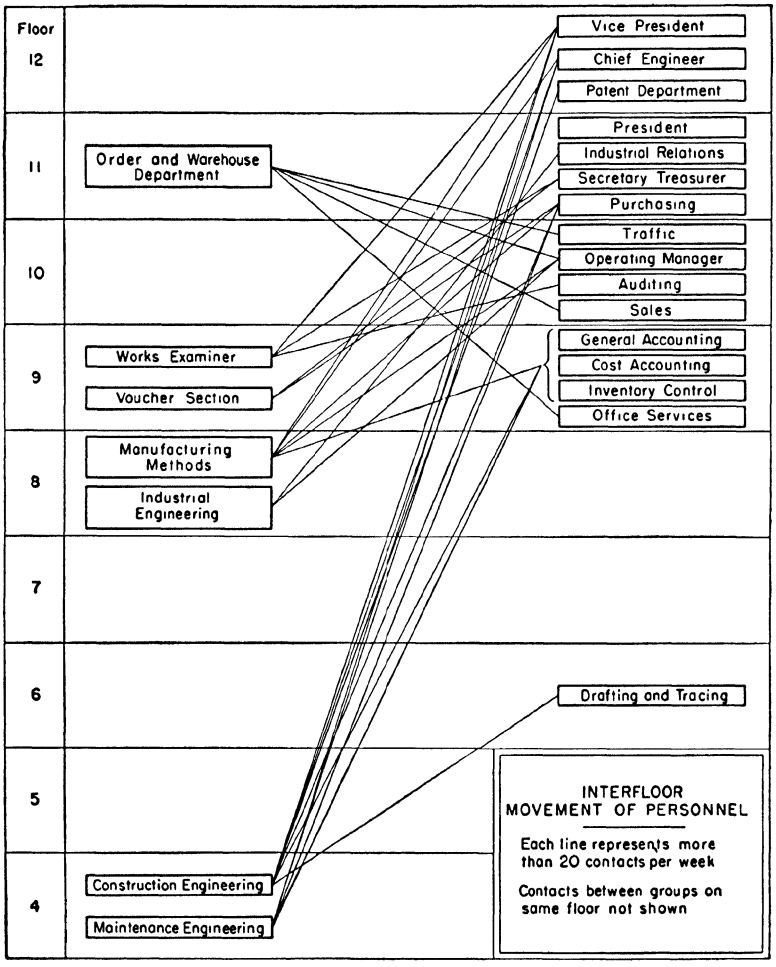


Fig. 20. Graphic Presentation of Personnel Movement

Following is a check list of the questions that should be asked in testing the design of existing forms as well as proposed new forms:

1. *Is the form clear?* Is its title sufficiently definitive to indicate the express purpose or use of the form? Are all its captions self-explanatory, or is there likely to be some question about the exact information required? Is it clear who should fill in each space, box, column, or line? Is the routing or distribution of each copy plainly evident? Are the various copies identified by numbers, titles, or different colored papers? If the form is used by many people throughout the organization, does it contain printed instructions wherever necessary to promote understanding and uniformity in its preparation? As an illustration, Fig. 21 shows the printed instructions appearing on the back of one company's employee expense report form. A note on the face of the form calls attention to these instructions.

2. *Is the amount of writing minimized?* Have words or clauses which must be used repeatedly been printed on the form so that only the variable information needs to be filled in? This technique can be adopted even though the printed information does not apply to every transaction covered by the form. For example, a company having few items in its product line might print the names of all products on its order, invoice, and bill-of-lading forms. Thus the items covered by any one copy of these forms would be specified by the quantity figures entered ahead of certain product names. An equally common way of reducing the amount of writing is to provide boxes for checking any of several printed captions rather than print questions which require word entries.

3. *Are the location and sequence of information geared to preparation and use of the form?* If the information on a form is copied from or posted to another form, are the items on both forms arranged in the same sequence? For example, if customer master information cards are used in the typing of sales orders, the card record should be virtually a facsimile of the order form. Or, if data on the form are to be punched into tabulating cards, the form should lend itself to good punching sequence. Where more than one person enters information on or uses the form, are the items which concern each person grouped together to speed up writing, analysis, or reference? (This requirement cannot always be fully met, since the information referred to by one user may be entered by more than one clerk. Where this is true, preference should be given to the person who would lose more time by poor arrangement.) If each space on a form does not always need to be filled in, are the most used spaces at the top of the form? Is the file-

INSTRUCTIONS FOR FILLING OUT THE EXPENSE REPORT.

General

1. If you incur expenses daily, send in your expense report at the close of each calendar week. If you incur expenses only now and then, hand in your report not later than one week following the date of the expenditure
2. All major items of expense must be supported by receipts: attach to your report such receipts as those received for hotel service, for railroad and airline transportation, etc
3. Make a copy of the report for yourself—you'll find it a convenience for answering questions or for checking against the accounting department's records.

Dates

1. The date in the upper right-hand corner of this report is to be the one on which you hand in your report.
2. After "from" and "to" on the second line, put in the first and last dates of the period for which you are reporting expenditures. All expenses for that period of time must be included.
3. Date column: Show the date on which each item of expense was incurred. If more than one item was incurred on the same date, don't repeat the date.

Location

Use this column to show the name of each city visited Be sure the correct location is indicated for each item of expense. However, when several items were incurred in one city, don't repeat the location.

Nature of work

Use this column to state, in general terms, the nature of each work assignment. Show the calls made; when you make calls on several firms, list the name of each firm.

Description of expenses

1. In this column, itemize and briefly describe each item of expense. Don't combine different kinds of expenses in one item
2. When you report transportation expenses, specify the kind of transportation—bus, train, airplane, automobile, etc
3. When you report transportation by automobile, support the amount claimed by showing the number of miles traveled multiplied by the mileage rate.
4. Even though the personnel traffic representative paid for your transportation tickets, enter that information in this column. For example, "R.R.—New York City and Washington through P.T.R., $19.80." Do not enter the cost of these tickets in the "Amount" column.
5. Airplane transportation purchased on scrip cards should be listed in this column. For example, "Washington and New York City—scrip." Do not enter the cost of this transportation in the "Amount" column.

Amount

Enter in this column only those amounts of money you actually paid out.

Distribution of expense

Enter in this block the correct account number. (The account number consists of a two-digit control account number plus a two-digit subaccount number. Control account numbers applicable to each department are listed in the "Departmental Responsibilities" section of the Accounting SPI Manual; subaccount numbers are listed in the "Expense Subaccount" section of the Accounting SPI Manual.) If the items on this report are to be charged against an authorization order, be sure the correct A.Q. number and product code number are entered. (For list of product code numbers, see "Profit and Loss" section of Accounting SPI Manual.)

Fig. 21. Instructions Covering Use of Printed Form

reference information positioned according to the method of filing or binding?

4. *Is the form well spaced?* Is enough room allowed for each entry to avoid the danger of crowding, unintelligible abbreviations, or incomplete information? Are the vertical dimensions of spaces related to the method of filling in the form, e.g., hand or machine? If the form is to be typewritten, has the printing been arranged to minimize the number of starting points and thus to permit maximum use of the tabular key? If the form is to be bound at the sides or top, are adequate binding margins provided?

5. *Is the size of the form right?* Is it so small that it is difficult to handle or likely to be lost? Is it too large for convenient filing? Is it a standard size that can be printed economically? If it is to be inserted in an envelope, are its size and shape such that no fold or only one fold is necessary?

6. *What other features have been employed to facilitate preparation or use of the form?* Where multiple-copy forms are used in large volume, are they printed as continuous forms to eliminate repeated insertion and alignment in the typewriter? Where desirable, are spaces on the form numbered to facilitate reference or to relate the parts of the form to written instructions covering its use? Are colored papers used to indicate where or when the form was initiated? Has the distribution of copies been planned so that the persons who use the form most receive the original or clear carbon copies? If the form is to be mailed, is it designed for insertion in a window envelope?

Improving the filing system. Filing operations generally receive little attention in procedures studies. Yet 10 to 15 per cent of the entire clerical cost of the process may be spent on filing or on searching files for the documents the procedure has produced. By simplifying these filing and finding operations, the analyst can not only save clerical and supervisory time but also encourage the use of valuable information that lies buried in the company's files and records.

The following paragraphs suggest some of the key points the analyst should consider in reviewing the method of filing individual documents—whether they be cards, printed forms, or correspondence. The reader who wishes to examine the principles and techniques of good filing in greater detail will find a number of excellent books devoted fully to that subject.

Since the purpose of any file is to facilitate the finding of a document when it is needed, the type of filing system used should be governed by these two factors: (1) the information by which the material filed is most likely to be referred to or identified; and (2) the probable frequency of reference to the file. The latter factor has, of course, an economic bearing on the problem, for the more frequently a file is referred to, the more money can profitably be spent on clerical labor and equipment to maintain the file.

1. *Simplicity.* The first requirement of any filing system is that it be simple to understand and operate. This means that any document should be easy to classify for filing and easy to find after filing. Numerical filing, for example, is usually faster and more accurate than alphabetic filing and should, therefore, be used whenever either alternative is feasible. The analyst should also be on the watch for involved methods of classifying or indexing, complex cross-reference techniques, or other special features that are likely to increase the volume of error or require the use of highly trained operators.

2. *Indexing.* The speed of finding a given file position (either to insert or remove a document or to post to a card record) is determined almost entirely by how well the file is indexed. The most complete form of indexing is a card file or loose-leaf binder in which the reference margin of every card or sheet is visible. The cost of this kind of equipment is usually justified whenever a large number of references or postings are made to each form before it is permanently removed from the file.

In so-called "blind files," such as tub files, wheel-attached cards, drawers of addressing-machine plates or stencils, etc., visible indexes should be provided for every 20 to 30 units, depending on how fast the file is expanding. Fewer index dividers may be needed in a conventional file of manila folders provided the reference tab on each folder is clearly identified and visible.

3. *Posting to Record Files.* In studying files of records to which postings are made, the analyst should also consider whether the type of file is best suited to the method of posting. If the record is posted by hand, can the entry be made without removing the card or sheet from the file; if by machine, can the form be removed easily?

4. *Folder Filing.* Even when the finding of individual folders has been speeded up by better indexing of file drawers, much time

can be wasted in filing documents in the folder or removing them from the folder. Ideally, the file clerk should be able to perform these operations without lifting the folder from the file drawer. For this reason, the practice of fastening documents to folders should be avoided wherever possible. As long as a folder remains in file, its contents are not likely to be lost or disarranged. When it is removed to be sent to another department, the material can be quickly clamped to the back of the folder by a spring clip.

Other aids to fast filing are individual hanging folders and hanging cloth jackets, each holding four or five manila folders. With either device, folders remain erect with their reference tabs plainly visible, and at the same time the file can be kept loose enough to permit fast drop filing.

In examining the individual folders which make up the file, the analyst should also consider in what sequence papers are placed in the folders. The possible alternatives are (1) to drop each document at the front or back of the folder, and (2) to interfile the document in some predetermined order among the papers already in the folder. Obviously the first alternative results in faster filing but slower finding than the second. The choice, therefore, should be determined by the probable frequency or reference to the file.

As an illustration, let us assume the following conditions:

a. That a correspondence file contains folders not for individual correspondents but for small alphabetic breaks, such as Aa-Ag, Ah-Al, etc.
b. That interfiling every letter within the proper folder takes five seconds more than drop filing.
c. That finding a letter in an unalphabetized folder takes 20 seconds longer than finding a letter in an alphabetized folder.
d. That an average of 10 per cent of the letters in all folders are referred to after being filed.

Under this set of conditions, drop filing would obviously be the more economical practice, since the increased finding time for every 100 letters in the file would be only 200 seconds while alphabetic interfiling of these 100 letters would have taken 500 more seconds than drop filing. The net saving of time decreases, however, as the percentage of reference increases, and the advantage swings the other way when more than 25 per cent of the letters are referred to.

5. *Filing or Posting Sequence.* Finally, the analyst should find

out if the documents to be filed or posted to a card record are first sorted in the same sequence as that in which the file or record is arranged. Except where a small file or record is involved, this practice will usually save more time in filing or posting than that lost in presorting.

Improving the division of labor. To conclude the development phase of his study, the analyst should prepare work-distribution charts (see Figure 12, page 168) covering the activities and tasks to be performed under the recommended procedure. This will help him decide how many people will be needed and how the various tasks should be divided among them. Of course, this step will not be necessary where few major changes are being recommended, but here the analyst should at least reexamine the original work-distribution charts to see what improvements can be made in the existing division of labor.

Determining the best division of tasks among a clerical force is no easy matter, for in most situations the analyst will find strong arguments favoring both specialization and flexibility in the use of personnel. Since these arguments will have different weights in different situations, all that can be done here is to suggest an approach that will help in reaching well-balanced decisions.

As a starting point the analyst should apply these two tests to the existing or proposed division of labor:

1. Is the most economical grade of labor employed on each task? In any office operation, some tasks require the exercise of judgment and volition or the use of specialized skills. Others require extreme care because the results of error can be costly. Still others are easy to learn and require little concentration or manual skill. Thus, to obtain maximum economy in the use of clerical labor, tasks must be grouped according to skill and experience requirements so that salary levels will reflect the real value of work performed.

2. Are several different tasks requiring the same grade of labor being performed by each of several clerks? Let us suppose, for example, that three tasks within one organization unit require different types of eye-hand coordination or manual dexterity but that all three require an equal *grade* of skill and, therefore, command the same salary. If this work in total requires three operators, should each task be fully assigned to one operator or be divided among the three? At least in principle the first alternative should be chosen since greater specialization ordinarily means greater pro-

ficiency. In addition, less time would be wasted if each operator were not required to jump continuously from one task to another.

These two guides are deceptively precise, for in actual practice few problems on division of work are as clear-cut as we have implied. The detailed clerical operations of any one unit may require many fine gradations of skill or experience, and where the content of one job should end and another begin is, therefore, still difficult to answer. Moreover, in applying these principles of specialization, the analyst must also weigh the factors favoring diversification of work. The first two factors are (1) the protection against job fatigue or monotony which comes from an occasional "change of pace" in an operator's work, and (2) the lost time that may result if a given transaction passes through many hands. The more time each operator must spend in familiarizing himself with a given document, the more support there is for having each operator perform several related steps on a batch of documents instead of a single step on all documents. (3) In smaller organizations, diversification of duties makes possible more flexible use of the work force when some persons are absent or when the work load shifts. (4) The fewer the persons handling any one document, the less will be the temptation to set up special controls over its progress through the routine.

Chapter 13

EXPLORING THE APPLICABILITY OF ELECTRONIC DATA PROCESSING

The basic principles to be followed in choosing the optimum *method* of performing a data-processing activity have already been set forth in the preceding chapter. These principles are, of course, as applicable to electronic data-processing methods as they are to manual or electromechanical methods.

Nevertheless, the whole subject of electronic data processing (EDP) needs separate treatment for these two reasons:

1. The evaluation and application of electronic computers to business data processing is a much vaster, more encompassing project than any procedures analyst heretofore has had to tackle. The effort required to carry out such a study can be measured only in man-years. Equally large sums of money are required to install and operate electronic equipment. And, finally, successful exploitation of this tool may depend on far-reaching organization changes and new approaches to decision making and control. For this reason, the basic approach to methods selection already set forth needs to be interpreted and amplified if it is to be skillfully applied to the evaluation of electronic equipment.

2. Much of the work done to date in making EDP feasibility studies has been superficial and faulty and, as a consequence, has led to unsound decisions. Hence, special coverage of this important phase of modern office operations is needed if the procedures analyst is to avoid many of the costly mistakes that others have made.

It is the purpose of this chapter, therefore, to suggest an approach that, in any given company, will help produce a fact-founded, intelligent decision on the electronic-computer issue. More specifically, this chapter covers:

1. The steps to be taken in carrying out an electronics feasibility study.

2. Criteria to be applied and pitfalls to be avoided in reaching a decision on (*a*) whether to install an electronic computer, and (*b*) if so, which machine to select.

The critical point of view. As a prelude, however, to the treatment of these two subjects, it is important to emphasize that the quality of the result achieved in this whole area is largely dependent on the frame of mind and set of values with which one undertakes the EDP exploration. As a starting point in understanding what this point of view must be, the analyst is urged to refer again to the shortcomings of the "mechanization approach" discussed in Chapter 3, "Barriers to Procedures Improvement." If there is a single area to which the cautions set forth on those pages are most applicable, it is the area of electronic data processing. No other problem on which the analyst might work calls for such objective, tough-minded, profit-oriented thinking or for such persistent, skillful effort. The reasons underlying this need are these:

1. This sort of rigorous, disciplined approach is required to deal effectively with the pressures of promise and threat that surround the whole subject of office automation today. Probably no development in American business history has so exhausted the lexicon of catchword superlatives as electronic data processing. From all sides one is lured by the promise implicit in such terms as "push-button accounting," "fantastic speeds," "administrative automation," "the computer age," "office revolution," "the electronic frontier," and "the indispensable tool of management." And one is given further assurances that EDPM will have "a profound impact on management effectiveness"; that by failure to use it, a company "condemns itself to competitive catastrophe"; that its use "opens up a vast new world of profits"; that at the "flick of a button it instantly provides the information needed for management decision making"; that it "breaks through the barrier of human limitations"; and that, therefore, it may well "control your business future and the future of your company."

There can be little doubt whatever but that magic words such as these have tended to mislead managements and even to panic some of them into making premature or unwise commitments in the electronics field.

2. Next the viewpoint and caliber of effort just described are es-

sential if the company is to get the maximum value from its computer.

At the time of this writing, the great majority of business computer applications throughout the country are nothing more than the electronic automation of what was done in the past under essentially the same organization arrangement that existed in the past. The result is that the number and magnitude of the benefits realized have, in many instances, been quite disappointing. Some companies have even experienced higher data-processing costs under electronic methods than under former punched-card or still simpler methods.

This is not the fault of the computer. It results from failure to utilize the full potential of a powerful and versatile tool. Few people yet appreciate what wholly new concepts of data-processing integration are needed to exploit this new resource skillfully. Even fewer have been willing to face up squarely to the organization changes that often must be made if the company is, in fact, going to achieve any significant savings. Finally, not more than a handful of companies have yet done the difficult job of learning to use this new tool in the management of the business.

3. As a closely related consideration, a clear-eyed, objective point of view is needed if the analyst is to keep the computer in proper perspective within the framework of the broader, more fundamental problems of (*a*) controlling clerical costs and (*b*) improving the information used by management for decision making and performance measurement.

THE ELECTRONICS FEASIBILITY STUDY

Fortified with the critical point of view needed for a sound ultimate decision, the analyst's approach to the electronics feasibility study should consist of the following major steps:

1. Reach a realistic understanding on what the true objectives of the study are, and how ready the organization is for fundamental changes in its data-processing activities.

2. Make a preliminary study to:

a. Determine—on a "rough-cut" basis—whether the use of an electronic computer of any size seems sufficiently attractive to warrant the effort and expense of a detailed study.

b. If so, identify what appear to be the most promising applica-

tions. These will form the bases for the more intensive study that follows.

3. Make a detailed study as the basis for:

a. Reaching a final decision on whether to install a computer.

b. Determining the minimum conditions required to justify the installation of a computer at some future time, if existing conditions do not warrant its use now.

c. Selecting the specific size and make of hardware, if a decision should be reached to proceed with the acquisition and installation of a computer.

Realistic assessment of objectives and climate. As the initial step, the analyst ought to reach clear understanding with management on the important "ground rules" and attitudes that will determine the scope of the feasibility study and how best to organize and prepare the way for it. This means finding out answers to such questions as these:

1. What is the real reason that the company is undertaking the study? Specifically, is the study looked upon as a true economic evaluation of the applicability of computers to the company's operations—which evaluation might conceivably lead to a decision *not* to acquire a computer? Or, is the study essentially a hardware-selection project aimed at determining the most suitable size and make of computer?

2. Will top management insist on achieving the same rate of return on its investment in a computer as it demands before investing money in new production equipment? Or, does management feel that computers are "the thing of the future" and that, therefore, it is willing to "pay a price" to experiment with and learn how to use them now? If this latter point of view prevails, how much of a "price" is the company willing to pay for this experimentation and familiarization? That is, how much less than the rate of return normally demanded on its investments will management be willing to accept?

3. How ready is the company to carry out substantial organization changes or realignment of responsibilities for data processing, if these should be needed to maximize the use of the computer?

4. How much management emphasis is placed on the potential uses of the computer in facilitating the over-all management process of the company? How concrete has the thinking been on this potential use? That is, have specific problem-solving or control opportunities been identified? Or, has management merely expressed a vague, hope-

ful wish for "faster and better information"? How willing is management to "stand still for" the kind of fundamental study needed to evaluate and capitalize on these more sophisticated uses of the computer as contrasted with routine data processing?

Preliminary size-up of opportunities. Once these basic "ground rules" have been laid down, the analyst is ready to undertake the preliminary step of determining whether the use of a computer appears sufficiently attractive to warrant the making of a more definitive (and costly) study. This diagnosis should be aimed at developing answers to the following questions:

1. How many people might be displaced by use of computers of different size classes? How does this order-of-magnitude gross saving compare with the probable range of costs for operating the computer (including each year's allocated share of the one-time set-up costs)?

2. What potential uses, if any, are there that could help reduce inventory or production costs and what is the probable dollar range of savings? What possible uses might speed up or otherwise improve service to customers and what is the commercial significance of these improvements?

For each of these two classes of questions, the following material outlines (1) how to identify possible improvement opportunities or to select activities to be reviewed, and (2) how to make the preliminary evaluation of each of these opportunities or activities.

Clerical Cost Reduction Opportunities. For the reasons outlined in Chapter 5, the unit of study here should *not* be the work of a single organization group (however large). Rather it should encompass all the interconnected activities forming parts of one of the major paperwork processes of the business. Only in this way is it possible fully to utilize the capacity of the computer for handling related work as a single integrated process.

In this area, the criteria for selection of activities to be reviewed are fairly obvious. They include:

1. *Number of persons engaged in the process and stationed at the same location.*

2. *Number of persons engaged in the process but dispersed among several locations.* Here the added facts to be considered are (*a*) the number of employees at each location, (*b*) the distances between locations, and (*c*) the cost of the least expensive form of communication (e.g., airmail or teletype) that would meet minimum speed requirements.

3. *Simplicity of the process* as measured by the number of different operations performed and the volume of exceptions. As an example, a production planning and scheduling process will often prove to be more complex than a payroll and labor-cost-distribution process.

4. *Frequency of access required* to basic records forming part of the process. The larger the volume of single-transaction, random-access references that must be made, the less attractive the process becomes as a computer application.

5. *Degree of perfection already achieved in the process.* Some processes that meet some or all of the preceding criteria may already have been refined to the point that only marginal opportunities remain for cost-cutting through computers. An example might be a highly developed punched-card method of preparing payrolls.

Having thus selected the areas to be covered by his preliminary evaluation, the analyst should take the following steps for as many of these areas as necessary to reach a conclusion on the question of apparent feasibility:

1. Diagram or flow-chart the major steps in the process. This need not cover all the minor exceptions and should be done in only enough detail to account for 75 to 80 per cent of the total man-hours available to perform the process.

2. For each of these major steps, determine which can be performed on a computer and the number of man-hours now spent on each.

3. Examine each of the potential computer operations in sufficient depth to determine whether any further work eliminations or short cuts can be achieved under the present method of performing the work. This must be done, of course, to ensure that the EDP method is being compared with the most efficient possible alternative.

4. Estimate the machine time required to perform these operations on computers of different size classes.

As already indicated, these steps do not necessarily need to be taken for every potential application listed. It is conceivable, for example, that after the two most heavily manned processes have been evaluated in this way, the preliminary estimates will show that the manpower saving in these two areas will more than offset the cost of the computer and still leave unused machine capacity for other applications. If this should not be so, then additional applications would have to be evaluated until either a break-even point was reached or no computer capacity remained for further applications.

Opportunities to Improve Management Controls or Operating Results. The second area to be covered by the preliminary diagnosis calls for identification and evaluation of opportunities to strengthen management decision making and control, reduce operating costs, or improve service to customers.

For the first of these three areas of improvement opportunity, the analyst's approach should be to determine from key executives whether they have any clearly established need for different or faster information than they are now receiving. If any such need can be identified in specific terms, the remaining steps are to determine the following:

1. Can the desired new information be obtained under present methods, and, if so, when and at what cost can it be obtained?
2. If it cannot be practically obtained by present methods, can it, in fact, be produced by the computer within the specified time limits?
3. If obtainable, the line of questioning set forth in Chapter 11 should be followed. That is, on the basis of each piece of additional information, what specific kinds of decisions could be reached or what kinds of action taken? What might be the potential payout of such decisions and actions? What would be the potential payout of having existing information furnished more quickly through the use of the computer?

To identify bona fide opportunities to reduce operating costs through the use of a computer, the analyst should determine (1) the major elements of cost and (2) what has to be done well to minimize each of these elements (e.g., increase the utilization of transportation equipment or high-cost production machines, reduce work spoilage, maintain lower inventory levels, select optimum transportation methods and routing on outbound shipments, level out production irregularities in the plant).

The analyst should then discuss each of these areas with the operating executive concerned to determine such facts as the kind of information now used to achieve optimum results, the frequency and speed with which this information is provided, and what new kinds of information or speed-up of existing information are needed. If any apparently worthwhile needs are identified by this process, they should be subjected to the same kind of analysis as that described above for improving management controls.

The approach to identifying and evaluating opportunities to improve customer service should be much the same. First, determine

whether any problems or opportunities to gain a competitive advantage appear to exist in the speed of service now rendered to customers. For example, are there significant out-of-stock occurrences, back orders, or shipping delays because of inability to maintain well-balanced inventories? If such problems or opportunities exist, what is a realistic measure of their commercial significance? Can they be corrected or exploited by present methods? If not, can these gains be achieved through use of a computer?

Detailed feasibility study. If the preliminary size-up reveals what appear to be attractive possibilities for use of a computer, the study team then must undertake the detailed analysis needed to provide the basis for (1) reaching a final decision on whether to convert to electronic data processing; and (2) selecting the specific make and quantity of hardware. This phase of the study will normally center around a specific category of equipment since the preliminary diagnosis will have indicated whether a medium-scale or large-scale general-purpose computer or some special-purpose type of equipment is most suitable to the company's operations.

Depth Analysis of Existing Routines. The initial step of the detailed feasibility study is to gather all the essential facts about the most promising applications identified in the preliminary study. These facts include:

1. The individual operations comprising each process. These should be recorded in flow-chart or block-diagram form. Figure 22 is an example of block diagraming.
2. Copies of all forms, records, and reports forming parts of the process.
3. Information on work volume and irregularities in the flow of work.
4. Manpower, machine, and operating-cost information.

Although these are the major categories of information to be assembled, the analyst will find it helpful at this point to review again Chapter 9, "Gathering the Facts," particularly under "Details of Existing Procedure" (page 143), and "Cost Factors" (page 150).

Two aspects of the detailed fact finding deserve separate mention. First, in an EDP feasibility study, particular attention should be given to recording the procedural details and frequency of all *exceptions* to the normal flow of work. Second, in gathering cost information, the total costs of each unit should be broken apart to show separately those costs that will and those that will not be replaced

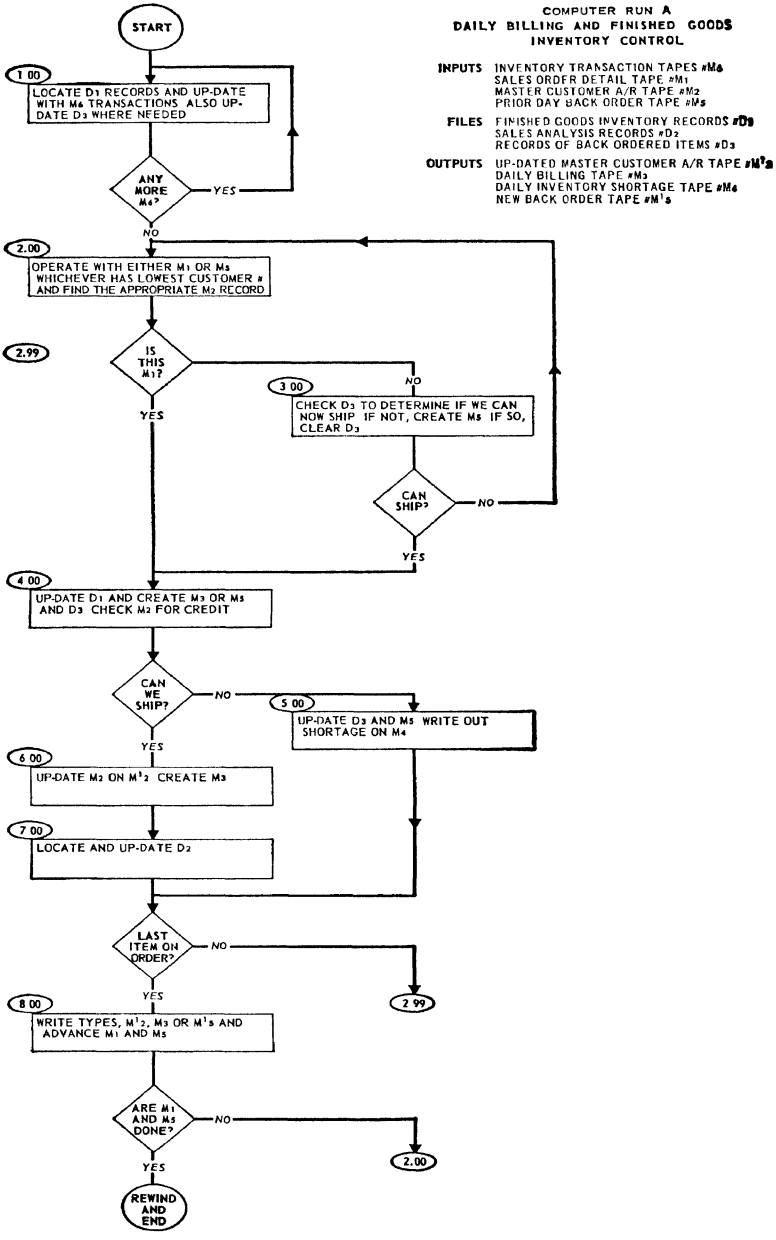


Fig. 22. An Example of Block Diagraming

by the computer. Usually the cost of input operations, that is, initial recording of data, will not be eliminated (e.g., existing key-punching operations).

Development of System Requirements. From his analysis of the existing routines, the analyst next must develop, in very specific terms, the requirements to be met under the proposed electronic system. This is a key step in the study and should be performed carefully in great detail. The reason is that the statement of system requirements developed at this point will form the basis for (1) development of proposals by equipment manufacturers, (2) determination of the type and quantity of equipment needed, and (3) development of reliable cost comparisons as a basis for the final decision.

As an example of the end product of this step, the statement of system requirements should include the following (these points are merely illustrative and, therefore, are not intended as a complete list):

1. Character and volume of each input document. What form will each take; that is, will it be created initially in handwritten or typewritten form, or—as a by-product of the initial writing—will a tape or card be prepared that permits automatic computer input without further conversion?

2. Character and volume of information to be stored in the EDP system. These are the master files of fixed information, as well as the summary records to which individual transactions are applied.

3. Character and volume of each output product, that is, each unit transaction document (e.g., a payroll check) and each summary report. For each summary report, the statement of requirements should show each piece of information required and the subdivision sequence—i.e., major, intermediate, and minor totals.

4. Timing requirements: (*a*) the frequency of preparation and time at which each output product must be completed, and (*b*) the length of time in advance of the deadline date at which input information is available. This information is essential to the development of tentative machine schedules showing total processing time for each application as well as overlapping demands among applications. Obviously, these overlaps in demand can increase the number of machine units required, even though no one machine is fully utilized throughout the month.

5. Character and volume of exceptions to the normal routine that are to be processed on the computer.

6. Information access requirements; that is, the character and frequency of random reference that will have to be made to individual items of information stored in the electronic system. For example, how often will it be necessary to look up statistics on the volume of sales to a specific customer?

Obtaining Equipment Manufacturers' Proposals. This statement of system requirements represents the key information that manufacturers need to develop their proposals. To ensure uniformity of coverage in the proposals obtained, the feasibility task force should also spell out in detail the information that each proposal should contain. Ordinarily, this list should include the following:

1. The type and quantity of equipment recommended.
2. The operating characteristics or specifications of the equipment. This should cover the elements of performance or capacity that are listed under "Selecting Hardware."
3. The manufacturer's estimate of each element of cost (one-time and operating) that is listed under "Determining Clerical Savings."
4. Copies of procedure or computer-run charts.
5. A detailed explanation of the assumptions on which the manufacturer's time estimates are based. For example, do computer-operating times assume optimum programing? What operations are assumed to overlap or to be performed concurrently rather than consecutively? Is time allowed for auxiliary operations such as setting up or rewinding tapes?
6. Delivery date on the equipment.
7. Accessibility of a similar installation for use in event of an equipment breakdown.

Determining Clerical Savings. As the key step in determining whether the proposed EDP installation will save clerical costs, the feasibility task force must estimate as accurately as possible (1) the nonrecurring equipment-acquisition, installation, and data-conversion costs, and (2) the annually recurring operating costs.

Nonrecurring costs. These one-time costs cover the following elements:

1. Equipment purchase costs. These should include not only the costs of the major units of equipment, but also supplementary equipment acquisition costs such as:
   a. Inbound transportation costs and sales taxes on the equipment, if applicable.
   b. The purchase price of all auxiliary equipment that may be

required, such as tape-producing typewriters and communications equipment.

c. The cost of magnetic tapes.

2. Training programers.

3. Programing the computer for each proposed application.

4. Preparing physical facilities for the installation (partitions, foundation, soundproofing, air conditioning, rewiring, etc.).

5. Converting data from their present form to the form required under the new system (for example, recording inventory or payroll records and converting them to magnetic tapes).

6. Training operators and technicians.

7. Indoctrinating executives, supervisors, and workers who will be affected by the computer installation.

8. Setting up and test-checking the programs on the computer.

9. Operating the present systems in parallel with the new during the trial run period.

10. Allowing for the effect of the learning curve. This covers normal loss of efficiency during the first several months of operation. Since this inefficiency delays attainment of anticipated savings, it should be treated as an additional cost.

Annually recurring costs. This category should include the costs of the following:

1. Annual equipment rental. This should cover not only new equipment, but also any existing punched-card equipment that will have to be retained.

2. Operating personnel. This would include personnel required for supervision, computer operation, data balancing and control, and continuous programing work. The latter category would include the work that will have to be done—after the initial installation—to program additional applications for the computer and to refine further or modify the programs that make up the initial installation.

3. Equipment maintenance. These costs are ordinarily included in the rental contracts of the manufacturer and, therefore, need be determined only if the equipment is to be purchased.

4. Operating supplies, such as printed forms, punched cards, and paper tape.

5. Space occupied.

6. Incidental items, such as insurance coverage on the equipment and electric power consumed.

Pitfalls in estimating. Chapter 12 dealt with some of the mistakes

that are frequently made in estimating the payout on all types of proposed office machine installations. One of these mistakes lies in attributing to the new equipment clerical savings that could be achieved under the present method.

In addition to these error hazards common in estimating costs for all types of office equipment, a number of other pitfalls are particularly troublesome in estimating EDP costs.

The first of these lies in underestimating the one-time change-over costs. This might result from (1) not providing enough time or money for preparatory steps that are recognized, and (2) overlooking some elements of preparatory cost entirely.

The preparatory step that is referred to as "programing computer applications" illustrates well the first type of estimating error. Few people fully appreciate in advance the degree to which machine programing must be broken down into the most minute steps. One manufacturing company adopted as its first computer application a payroll procedure covering 8,000 employees, some of whom were on a complicated incentive system. Preparing and coding the original program for this application required 200,000 separate machine instructions and took 20 man-years to complete. Another company that originally estimated 10 to 12 man-years to program its full installation wound up spending over 35 man-years.

The second type of error lies in underestimating the recurring operating costs of the EDP installation. This happens for many reasons, of which the following two are the most common:

1. In a substantial number of feasibility studies, machine-operating time has been badly estimated. On some applications, for example, actual processing time has proved to be two to three times as great as originally estimated. One reason is failure to program skillfully or to anticipate the number of programing steps involved. Another is the necessity for running all transactions through a complicated series of machine steps to test for rare exceptions. Still another reason is failure to allow adequate time for reruns resulting from operator or computer error.

2. In addition, the degree of machine utilization is often overestimated. One important underlying cause here is failure to recognize that peaks and valleys in work load are just as much a problem in electronic applications as they are in punched-card procedures. In addition, inadequate time is often allowed for the continuing "debugging" operations required as new programs are developed or exist-

ing programs revised. For these and similar reasons, it is rarely practical to load a computer more than 70 to 75 per cent of the available time.

Executives who must ultimately make the decision on an EDP proposal can minimize the dangers of these estimating pitfalls by taking the following steps:

1. Insist that savings estimates be *proved* and *demonstrably* conservative. That is, make sure that they are supported in detail and are not merely broad, over-all estimates.
2. Be sure that provision has been made for every one of the elements of preparatory cost already listed.
3. Require the task force to estimate how much the cost of existing systems and procedures could be cut by applying to them only part of the analytical effort that will go into the electronic installation.
4. Require the task force to compare its estimates of programing and operating costs with those of other companies using similar equipment on similar types of applications.

Evaluating Indirect Benefits. In all probability, the computer will make its greatest ultimate contribution, not in reducing clerical costs, but in helping management to run the business more effectively. As already pointed out, these potential benefits might take the form of (1) tighter control, (2) more informed decisions on alternative courses of action, (3) reduced manufacturing or distribution costs, or (4) better service to customers.

In some instances, these benefits might be realized from more rapid processing of recurring transactions and provision of faster and better summary information. As an example, one aircraft manufacturer realized the following benefits by installing a large-scale computer to handle its production-scheduling and inventory-control activities:

1. The average elapsed time between issuance of engineering changes and shop orders was reduced by three weeks.
2. Information on potential shortages of parts became known two weeks earlier than formerly.
3. Through use of the computer, the company was able, for the first time, to develop alternative production schedules under different priority and delivery-schedule assumptions. Thus management is now able to see the cost and production implications of various alternatives before making decisions.

In contrast to speeding up the availability and increasing the

amount of conventional data, the computer might also produce major benefits by making possible the application of advanced mathematical techniques to the solution of business problems. This is the method of analysis that has become widely known as "operations research." Following are some illustrations of the kinds of results that have been produced in some companies through the use of a computer:

1. More skillful adjustment of production to sales by achieving the optimum balance among changes in size of labor force, overtime payments, and inventory and back-order levels.
2. Determination of the product-distribution pattern that will achieve the lowest combined cost of freight and field warehousing.
3. Better utilization of production facilities by determining the optimum product mix and running time.

These potential values of the computer as an aid to management offer great promise to many companies. But the analyst cannot rest his case on promise alone. His job is to make a realistic, fact-founded assessment of what benefits, if any, these potential uses would produce *in his company*. The following guidelines will help the analyst in making this evaluation:

1. To determine the significance of more or faster management information of the conventional type, apply the evaluation techniques already outlined in Chapter 11.
2. To determine whether the company has sufficient operations-research work to warrant acquisition of its own computer, give adequate weight to the following considerations:

a. Not all companies have the same type of opportunities to use operations-research techniques profitably. Typically, companies in which these techniques are most applicable are those that represent a complex situation of interdependent factors; that is, companies that have recurring operating problems involving a large number of related variables that can be expressed quantitatively. For example, the number of opportunities to apply operations-research techniques requiring computers in their solution is probably greater in an oil refinery or a consumer paper-goods manufacturing company (with its high facilities investments and distribution costs) than in a specialty pharmaceutical manufacturing company in which by far the most important factor affecting competitive position is skill in new-product development.

b. Not all operations-research problems require EDP equipment for their solution. It is true, of course, that electronic computers can

perform the calculation work required in virtually all operations-research problems. But as one leading operations-research specialist has said, "the use of an expensive computer on many operations-research problems is like shooting gnats with cannon balls." In fact, this authority has estimated that only a relatively small percentage of all operations-research problems require the computing capacity of electronic equipment. A great remaining volume can be handled by simpler computing devices such as slide rules, adding machines, and hand-operated desk computers.

c. Companies that do have operations-research applications requiring computers do not necessarily need to buy or rent their own computers to fill this need. Many operations-research problems requiring electronic computers are simply "one-shot" problems. That is, after having been solved once, they can often be reduced to a formula, which, in turn, can be administered by clerical personnel. Thus, notwithstanding its important potential profit contribution, the volume of operations-research work for many companies is likely to be so small that they would be better off to "farm out" such problems to some computer service organization.

d. Do not make the mistake of assuming that the mere acquisition of an electronic computer will result in performance of any significant amount of operations-research work within your company. There is a saying among the military that "radar alone cannot bring down an enemy plane." It is equally true that the existence or use of a high-speed computing device still leaves a company a long way from the application of operations-research thinking and analysis to its problems. If a given company is not doing operations-research work without its own computer, the chances are that it will not do any just because it acquires a computer. The reason is that in the area of operations research, the primary need is not for equipment but for talent —the kind of talent that can identify profitable opportunities to apply advanced mathematical techniques to business problems.

Weighing Other Considerations. Notwithstanding the benefits that are estimated to result from a proposed computer installation, a final decision on the EDP issue should not be reached without weighing certain other intangible considerations. Of these, the three most important are:

1. *The impact of a computer on the organization.* Here the analyst must meet a twofold need. First he must determine what consolidation of work units or other even more fundamental organization

changes will be needed to realize fully those benefits that are being cited as justification for acquiring a computer. Second he must determine what is the likelihood that these organization changes or shifts in responsibility will, in fact, be made.

In proposing to set up a centralized data-processing unit, more than one divisionalized company has oversimplified these organization problems by reassuring its key people that it would only be "centralizing data-processing work—*not* decision making or control." Lulled by this initial assurance, one large company experienced a long and very costly delay in completing its conversion to EDP. The reason was that although division managers had agreed to the proposal in principle, they fought an effective delaying action as the conversion got under way. As they began to see people, equipment, and elements of expense taken out from under their line authority, they protested that such moves were contrary to the company's policy of decentralized management—even though loss of such activities did not in any way affect the operations or performance results of their divisions.

2. *Availability of competent staff personnel.* The next intangible situation to be weighed is the current level of technical and analytical skill in the company. That is, in view of the number of man-years of effort needed to prepare for, install, and perfect the use of a computer, does the company now have adequate manpower properly trained? If not, can it make available for training enough people with the right basic qualifications?

3. *Alternative uses of talent.* The final consideration grows out of the fact that in most cases in which computers are being considered, skilled manpower is more limited than is capital. Hence, before a company commits itself to installation of a computer primarily to handle routine clerical work, it should consider what alternative uses might be made of the personnel who are skilled in the analysis of management problems and in the exploitation of other profit-making opportunities.

Selecting Hardware. If—on the basis of these various criteria—the acquisition of a computer is warranted, the one remaining decision to be made is what make and model of hardware should be acquired. Assuming that more than one manufacturer's equipment is capable of performing the work to be done, the first determinant, of course, will be comparative costs. But, as was emphasized in Chapter 12, cost alone is not enough. The true value of any given computer will also

depend on a number of other factors that together determine its ease of use.

Before these factors are enumerated, an important point to be stressed is that each of them should be evaluated only in terms of the company's specific system requirements. As an example, higher output speed on one piece of equipment is of little significance if the slower speed of another computer is still adequate to meet the company's needs.

With this qualification, the noncost factors to be weighed in hardware selection include the following:

1. Machine speeds and capacities such as:
   a. Types of input media and the speed of each.
   b. Computational speed.
   c. Internal memory capacity.
   d. Single-item access speed.
   e. Types of output (tapes, cards, printers) and the speed of each.
2. Equipment reliability as indicated by the amount of down time experienced by other users.
3. Ability to meet special requirements such as the handling of alphabetic information or compatibility with communications hardware.
4. Ease of programing.
5. The reputation of the manufacturer for availability and quality of technical assistance.
6. Flexibility; that is:
   a. Amount of unused capacity in the initial installation available for future expansion.
   b. Ease with which the initial installation can be expanded, and cost of each added unit.

SUMMARY

Much of the burden of this chapter has been that of pointing out the pitfalls and stressing the magnitude of the effort involved in the installation of an electronic computer. This emphasis is not intended in any way to diminish the great potential contribution of the computer to business management. Rather it is aimed at promoting a realistic understanding of what must be done to capitalize on this potential.

Thus the key point to be underscored by way of summary is that there is no quick, easy path to achieving *optimum* use of a computer in business operations. Nor will the mere acquisition of a computer enable management to avoid any difficult problems that it was not willing to face squarely in the past. Clearly those who profit most—or indeed at all—from electronic data processing will be those who have the courage to apply an exacting, fundamental point of view to the question of whether or not to use such equipment at all. Only through its willingness to apply this kind of discipline will a company force itself to learn how to use this new tool at anywhere near the limit of its capacity or versatility.

Chapter 14

DEVELOPING INTEGRATED DATA-PROCESSING APPLICATIONS

Development of the techniques widely referred to as "integrated data processing" (or IDP) is a natural outgrowth of the fact—first pointed out in Chapter 5—that the paper work of any business is made up of not more than a handful of basic serialized processes. Each of these is a major network of related procedures that can be likened to a river system with its main stream and countless tributaries. Unquestionably the best example of such a business system is the order-filling activity, which consists of sales-order writing, traffic routing, credit approval, shipping, invoicing, maintenance of accounts receivable, and preparation of sales statistics. Another obvious example is the supply function, which consists of requisitioning, purchasing, receiving, and paying for items obtained from outside suppliers. Still another example is the labor accounting system, which consists of timekeeping, payroll preparation, and labor-cost-distribution procedures.

Some of the earliest organized efforts in the systems and procedures field recognized the interconnected character of these basic processes. As a result, the first fitful beginnings of integrated data processing took place in the form of the so-called "one-writing systems" that are still in use in many businesses today. For example, instead of preparing sales orders, acknowledgments to customers, shipping papers, bills of lading, and invoices separately, these forms have typically been redesigned in a way that makes it possible to prepare them all in a single writing.

This, however, was little more than a start. Since then, procedures staff personnel and office equipment manufacturers have been continuously seeking the development of techniques that would permit

a replacement of all parallel and overlapping processes with a single, coordinated process in which all the steps feed from and flow into each other. The next advance toward achievement of this goal was the widespread application of punched-card equipment to business procedures. This was the first true form of integrated data processing (according to the generally accepted definition of the term), because the information in a punched card can be reproduced or written or summarized solely by mechanical means.

But the term "integrated data processing" itself was not born until procedures analysts and office-equipment manufacturers developed the so-called "common language medium"; that is, a form for recording business data that is capable of activating not only tabulating equipment but also all the other types of equipment needed in a business organization to write documents, transmit information by wire, and accumulate data in summary form. This common language medium is a punched paper tape that can "communicate with" or activate a great variety of office machines. These include electric typewriters, adding machines, desk calculators, bookkeeping machines, graphotype machines, teletype equipment, and tape to punched-card converters. Thus, through the use of integrated data-processing techniques, machines at each step of a paper-work routine sense, process, and, in many cases, reproduce information in a medium or "language" common to all machines.

One of the pioneers in the field of integrated data processing, H. F. van Gorder of United States Steel Corporation, states that the basic purpose of IDP is to "put dynamic life into data at their inception." This, further states van Gorder, is achieved through the following two distinguishing characteristics of IDP:

1. At the point of origin, business data are recorded on office machines that create punched tape or cards as the automatic by-product of the recording operation.

2. Once recorded in this mechanical form, data are thereafter processed exclusively by machines. Thus, all data are self-perpetuating and the original writing serves all subsequent needs throughout the entire system of which it is a part.

Two other points need to be clarified in rounding out our definition: What is the distinction between integrated data processing on the one hand and (1) electronic data processing and (2) tabulating machine installations on the other hand?

The first distinction can be stated simply: Integrated data process-

ing is *not* synonymous with electronic data processing. In fact, a great many—if not the majority—of existing integrated data-processing installations do not utilize large- or medium-scale electronic computers. As an example, one leading chemical company established fully integrated data-processing systems in two of its major divisions without finding a single application for electronic computers. Hence, the conclusion to be drawn here is that most electronic computer applications to business procedures are one form—but *only* one form—of integrated data processing.

Some tabulating machine applications also represent a form of IDP. An example would be the processing of a customer's order simply by selecting prepunched tabulating cards from a tub file and, through use of these cards, writing sales orders and shipping papers as well as bills of lading on a tabulating machine. Later the same prepunched cards would be used to invoice the customer and prepare sales statistical reports.

But many, if not most, punched-card applications do not represent true integrated data-processing systems as these words are intended. The principal reason for this conclusion is that the key-punching operation in most tabulating operations usually represents the *second* writing of the transaction in question—the first writing having taken place when the source documents were prepared (e.g., sales orders, purchase orders, or time cards). And, in most installations, still other writings of the same data subsequently take place. For example, under a punched-card method of sales-order processing and invoicing, separate writings often take place in the preparation of bills of lading, teletyping of orders to distant warehouses or plants, posting of inventory records, or summarization of information for production planning purposes.

In summary, therefore, it can be said that although it is possible to build fully integrated systems around the use of electromechanical punched-card equipment, most such applications are not extended far enough to be correctly classified as full-blown integrated data processing.

Against this background of definition, the remainder of this chapter covers the following aspects of integrated data processing:

1. Representative types of IDP applications that exist in various industrial and commercial businesses.
2. Potential benefits of IDP.
3. Guidelines to the procedures analyst in making an IDP study.

Representative IDP applications. Of all the many kinds of IDP applications that have been developed, unquestionably the most common is automation of the sales-order-shipping-billing process and the procedures related directly to it. One of the earliest installations of this type consists of the following major steps:

1. Upon receipt of a salesman's handwritten order at company headquarters, an operator inserts a prepunched, five-channel, customer master tape in the reading mechanism of a special paper-punch electric typewriter. This tape activates the typewriter to write out most of the required information on a typewritten sales-order form. Special codes on the customer master tape stop the typewriter at the points at which the operator must enter variable or nonrepetitive information by use of the keyboard. As a by-product of this operation, the machine simultaneously punches a continuous paper tape containing all the information (both fixed and variable) that has been typed on the sales order form. This tape is the common language medium through the use of which all subsequent operations are performed mechanically.
2. The next operation is to feed the common language tape through a teletype machine to transmit the information to one of the company's eight plants scattered across the country. A teletype receiver at the shipping plant automatically types on a preprinted form the necessary shipping papers, bills of lading, and the like.
3. Once the common language tape has been run through the teletype sending machine at company headquarters, it is taken to the company's central tabulating room and run through a tape-to-card converter. This automatically creates punched cards that are used for all of the subsequent operations.
4. As soon as notice of shipment is received from the plant involved, the appropriate set of tabulating cards is pulled from the suspense file and run through a computing machine to extend the price by the quantity shipped.
5. These cards are then used to prepare invoices to the customer.
6. Following the invoicing, the same set of cards is used to prepare a variety of reports including:

   a. A summary of shipments for finished-goods inventory record keeping.
   b. Freight-cost reports.
   c. Accounts receivable summaries.
   d. Sales-statistical reports.

One other company that has also pioneered in the IDP field has gone even further than the procedure just described. That is, in addition to the operations already outlined, this second company has automated its accounts receivable, credit, and collection activities; finished-goods inventory record keeping; production scheduling; replenishment of warehouse inventories; and other related activities. In fact, a member of this second company has stated: "We have an integrated data-processing system for the whole income side of our profit-and-loss statement."

Still another company—this one a small specialty manufacturing company with only 60 employees—has developed a much more modest application but one that is still well suited to its circumstances. Personnel of this company type a combination order-invoice and shipping-document form on a special typewriter that automatically produces a by-product paper tape. This tape is then sent to a tabulating machine service bureau which prepares all the necessary summary reports for the company.

The extremes covered by these three illustrations underscore the fact that even for a common activity like order billing, the specifics of an IDP application as well as the degree of integration will vary widely from company to company.

In addition to these applications in the order-billing field, following are examples of applications to other paper-work activities within industrial companies.

One of these covers the purchase-order-receiving procedure. Here the process begins with the pulling of a traveling requisition containing a prepunched master tape on the item to be ordered. This is used in a tape-punching electric typewriter to write the fixed information on the purchase order form. The by-product common language tape created during this writing is subsequently used (in a tape-to-card converter) to create punched cards. These cards are used for purchase commitment reports, summaries of purchases by vendor, etc. In addition, the common language tape is used subsequently to type a multiple-copy receiving report automatically.

Another company, in automating its accounts payable process, creates a punched tape as a by-product of typing the accounts payable voucher. This tape is converted to cards which, in turn, are used to prepare a voucher register and a complete analysis of accounts.

Still another company creates a punched tape simultaneously with the typing of forms recording transfers of production from work in process to finished-goods stock. Punched cards prepared mechanically

from this tape are then used to run production control reports and inventory summaries for accounting purposes.

A final example of an industrial application is the use of a special tape-punch typewriter to prepare successively and automatically a laboratory report, an inspection report, and punched cards from which quality-control summary information is produced.

As already indicated, all the examples just cited cover manufacturing companies. But IDP is not limited, of course, to such businesses. For example, a newspaper publishing company in a large metropolitan area has an automated procedure for speeding start-up service to new subscribers. A stock brokerage house has an IDP setup for handling the paper work involved in cash receipts and check writing. Several of the railroads have installed a combination paper-tape and punched-card procedure for handling car dispatching and accounting. A large chain store maintains its continuous inventory records in the form of a punched-card tub file. This file also contains for each fast-moving item a prepunched master tape that is pulled from file, as needed, to write purchase orders automatically.

Potential benefits of IDP. Virtually every integrated data-processing application, including those described above, is aimed at achieving one or more of the following benefits (1) speeding up paper work; (2) reducing clerical costs; (3) increasing clerical accuracy.

Speeding up Paper Work. This potential benefit is considered first because, by itself, it has probably led to as many IDP installations as any other objective. In our experience, one of the reasons that so much attention has been given to automating the order-billing process is the competitive pressure to improve customer service by speeding up the whole order-filling cycle. As an example, the first of the three companies whose order-billing IDP installations are described above formerly required as much as three or four days to process a salesman's order and transmit it to the plant that had been designated to make the shipment. Through its integrated data-processing installation, this company was able to reduce this time cycle to three hours.

Other ways in which greater data-processing speed pays off are the faster preparation of key control reports to management and the availability of up-to-date information on inventories and open orders.

Reducing Clerical Costs. Although most companies believe that worthwhile reductions in clerical cost have been achieved from their IDP installations, these savings are sometimes real and sometimes illusory.

An example of the former can be found in the experience of the company that achieved the increase in order-handling speed already mentioned. Within a period of 18 months after installing its IDP system, this company had actually reduced the unit cost of processing a salesman's order by close to 20 per cent.

This does not mean, however, that every company can achieve such savings or indeed can achieve *any* savings simply by integrating its data-processing activities. In fact, some companies that have operated under this assumption have experienced an actual increase in their paper-work costs. This is likely to be the result if only one or two subsequent uses are made of the common language medium for expressing the original data. In such instances, even though some subsequent writing operations may be eliminated, this saving can be more than offset by the much higher degree of accuracy and the extra checking operations required at the initial writing.

In this consideration of clerical savings attainable through IDP, the analyst will profit from recognizing once again that one of the most common mistakes made in estimating the benefits of a proposed method is to attribute to it clerical savings that could have been achieved without having to adopt that new method. That is, the detailed procedures that underlie many IDP installations usually force a great deal of simplification, elimination, and standardization of existing clerical operations. Improvements of this sort can, of course, be immensely profitable. But it is equally clear that they can often be made within the framework of existing methods.

Increasing Clerical Accuracy. Since repeated manual transcription of data is eliminated under integrated data processing, most such installations have experienced virtually complete elimination of human error. But, as is pointed out later in this chapter, errors are not entirely eliminated by IDP, and when they do occur they are much more difficult to identify, track down, and correct.

Guidelines for an IDP study. Like most worthwhile gains, the benefits discussed above are not easy to achieve. Their attainment requires a great deal of hard, competent work. Moreover, experience shows that the path to achieving these gains is filled with a great many obstacles and pitfalls. To help avoid these typical hazards, the following list of ten do's and don't's will serve as guidelines to the conduct of an IDP study.

1. In launching an IDP study, be sure that the scope of the project has sufficient *breadth* and *depth* to ensure a fundamental and worth-

while solution. This is perhaps the most important single guideline and it has two major facets.

First, it means that the study should go deep enough to be concerned with management information needs, that is, with the end-use aspects of the information to be produced. The experience of a number of companies shows that the IDP program seldom produces a significant payout if it is limited simply to automating what the company now has.

Second, this point means that the study should be broad enough in scope to encompass at least a major segment of the company's paper-work activities. That is, it should not be a piecemeal approach but should cover at least one of the basic serialized processes referred to earlier. This is important to avoid the very high cost of making changes when additional and related procedures are subsequently added to the process.

Few people fully appreciate in advance how great can be the cost of making changes in a highly integrated data-processing system. Where the processing is done on an electronic computer, this high cost is incurred in reprograming work. But, even in a noncomputer IDP system, changes can be extraordinarily expensive. For example, after adopting such a system, one company found it necessary to change over from a three-digit to a four-digit product code. This meant not only that all of its forms had to be redesigned to provide adequate spacing for the new code number, but also that the tab stops on its electric typewriters and teletype and tape-to-card machines had to be changed. In addition, all the fields on its invoicing tabulating cards had to be realigned.

2. In preparing for an IDP study, be sure that every reasonable effort is made in advance to create a climate favorable to the making of major changes. A more skillful effort in this direction is likely to be made if those responsible for the study realize in advance the magnitude of the changes likely to be required.

Full-scale integrated data processing means that many departments of a business must achieve a degree of adaptation, conformity, and teamwork never before realized and seldom even imagined. To highlight this fact, one company paraphrases IDP by referring to it as "data processing by *integrated departments.*"

In addition, success of the study means that people must subject themselves to the discipline of truly simplifying and standardizing their procedures and of rigorously eliminating virtually all exceptions.

Another point of potential difficulty in people's attitudes is likely to be found when the inquiry starts to dig deeply into the area of data usage. This is a sensitive area to many executives, and too sharp a probing is likely to arouse tempers as well as conflicts of interest and opinion.

Finally, many IDP systems call upon managers and supervisors to give up the records they have been maintaining and to rely on others for record keeping and report preparation. This is often such a painful change that it has hamstrung the full development of more than one IDP program.

3. In carrying out the study itself, do not make the mistake of assuming that every step in the integrated system *must* be automated. This point is well illustrated by the experience of one nationwide organization which found that, with few exceptions, the five-channel common language tapes created at distant plants, warehouses, and sales offices could be airmailed in adequate time to the central processing center. This contrasts sharply with the widespread notion that if a company is to have an IDP setup, it should per se transmit all data by teletype.

4. Keeping in mind the preceding point, be sure again to apply to the IDP decision the basic mental discipline that has been referred to repeatedly throughout this text. That is, do not let yourself become fascinated by the nicety or novelty of the automatic system that grows out of your diagnosis. Just because a given activity can be reduced to an integrated data-processing system does not necessarily mean that this is the best method of performing that activity. It is only the best if it is the lowest-cost method of producing the desired end result within the limits of the speed and accuracy requirements that must be met.

5. Next, at a fairly early point in the study, be sure to pin down accurately and obtain general agreement on the trend of work volume and unit cost of handling transactions under the present method. Unless this is done, the analyst is likely, later on, to encounter real differences of opinion as to what savings have actually been achieved from the IDP setup.

6. When the project reaches the point of selecting the specific machines to be used, be sure that all equipment in the integrated system does, in fact, have a common language. Sometimes certain machines thought to be compatible do not "speak" precisely the same language. Although they are closely akin, some differences in "dialect"

do remain that require interpretation by machine modification, coding, or other special handling.

As an example, one company installed a battery of punched-tape electric typewriters only to discover that the keyboard arrangement, spacing, and other details were slightly different from those on its teletype equipment. The electric typewriters had to be returned to the manufacturer for modifications that cost over $2,000.

As an additional part of this guideline, be sure that the common language medium selected (e.g., five-, six-, or eight-channel tape or punched cards) will activate all the machines that are contemplated in the initial installation or that might be added later.

7. Next, in preparing for the actual change-over, recognize that the success of any IDP system requires a level of clerical accuracy or perfection seldom before attained in any organization. This is a prerequisite not only because errors are difficult to detect, but also because, once made, an error can easily be perpetuated throughout the system and, indeed, become compounded in magnitude. Another important fact to be borne in mind is that, under IDP, new types of error take on great significance. Ordinarily, the only kind of clerical error that has significance is the writing of an incorrect letter or digit. But, in IDP systems, the very spacing of a word or number on a document has equal or greater significance.

In light of these facts, two requirements are of special importance in any IDP system.

The first of these has to do with the training of operating personnel. This must be done in such a way that operators understand fully the reason for exactness at every point in the process.

The second requirement is that some type of accuracy control should ordinarily follow *each* machine used in the process. Such controls might consist of adding machine tapes, visual scanning, or self-verification features built into the machine. For example, tape-to-card converters can be programed to stop operating if the machine overruns the prescribed fields on any of the cards being automatically produced.

8. Make every effort to regiment or standardize procedures so that virtually all exceptions to the normal routine are eliminated. Generally the exceptions that must remain ought to be "hand-processed" around the IDP setup and then put back into the work batch at the end of the automatic process.

9. Bear in mind that the various types of IDP machines do not

all process data at the same rate of speed. Hence, maintenance of the right balance among the various machines is a continuing problem as the trend of work volume increases. This means that one of the qualities required in IDP supervisors is skill in production scheduling, machine loading, and equipment planning. And, in all probability, no supervisor will be able to do these important jobs well unless he is equipped with such supplementary tools and programs as work measurement, cross-training of clerical workers, and controlled release of work.

10. Finally, before making the actual conversion to the IDP setup, make an extensive trial run of the new procedures. This is needed to:

a. Verify the accuracy of the static information.
b. Verify the effectiveness of the accuracy controls.
c. Train and cross-train personnel.
d. Determine the man-hours and machine-hours required for the expected work loads.
e. Establish "machine balance" and scheduling requirements.
f. Test the procedures that will be used for handling exceptions.
g. Avoid the great investment in untried forms.

Summary. From this outline of pitfalls and prerequisites, it should be fairly evident that the glamor of IDP will dissipate itself very rapidly as the analyst begins digging into the countless details of developing such a system. But, the experience of every company that has undertaken such a development demonstrates that it is these details that will "make or break" the installation. As a staff executive in one large company put it, "In creating a profitable and workable IDP system, you've got to think big and do a million grubby little things."

Part Four

CASHING IN ON PROCEDURES IMPROVEMENT RECOMMENDATIONS

Chapter 15

PRESENTING AND SELLING RECOMMENDATIONS

The fourth phase of a procedures project is that of presenting recommendations and obtaining the acceptance or authorization necessary to put them into effect. This is the critical point in every study, for in the long run the value of a procedures staff will be judged not by the number or quality of the recommendations it develops but by the number and importance of the constructive changes made as a result of its work. For this reason, the presentation of recommendations should be preceded by the same careful thought and planning that went into the other phases of the study. The analyst must figure out who should be "sold" and in what order. He must be sure that he neither overlooks someone important nor makes random presentations to anyone who might seem interested. He must think through the strategy of gaining acceptance and inducing action. Or, stated another way, he must develop his presentation in terms of the interests, knowledge, and receptivity of his audience.

A well-planned program for putting across a major procedure change usually consists of the following two steps: (1) testing the details of the plan with down-the-line operators and getting their support, and (2) making a more formal presentation to the executives involved and getting final decision.

TESTING RECOMMENDATIONS AND GETTING OPERATOR SUPPORT

This first step merges into both the development and the presentation phases of the study. It is a transition step with the dual purpose of refining and solidifying tentative recommendations as

well as winning the agreement of those who must put them into practice.

Working "from the bottom up" in this manner is one of the most important "musts" in the whole procedures program. No matter how thorough an investigation was made, or how conscientious the operating personnel was about "telling all" to the analyst, some significant facts, conditions, requirements, or limitations are always overlooked until tentative recommendations are discussed. If the analyst first checks his thinking against the knowledge and experience of front-line personnel, he can uncover these concealed points while the plan is still fluid and without embarrassment to himself. Otherwise, these points have a habit of arising later at a time when they reflect unfavorably on the thoroughness of the study and, therefore, on the soundness of the conclusions reached.

A second obvious reason for starting at the bottom is that in reaching decisions on procedural matters, business executives tend to rely heavily on the opinions of their operating supervisors. The field of clerical activity comprises a great many details completely foreign to the average executive. It is not difficult, therefore, for an unwilling or unconvinced supervisor to raise objections that effectively "close the mouths of the uninformed." On the other hand, the experienced analyst knows that department and division heads seldom turn down procedures proposals on which their supervisors and work leaders are thoroughly "sold."

A final reason for this preliminary review is that it generally helps the analyst to anticipate possible points of resistance in later presentations. Subordinates often reflect or at least are familiar with the attitudes of their superiors. A good many procedures proposals have been put across only because some clerk or unit head forewarned the analyst by saying, "I think this is a good idea, but if I know the boss, he'll turn it down because. . . ." By knowing of these probable barriers in advance, the analyst has time to think through the best strategy for getting around them or for minimizing their effect on the final result.

In general, the proposed changes should be checked with at least one person in each of the smallest working groups affected. This may not be practicable, of course, where the new procedure is to be installed in a great many like units within a multiple-branch or multiple-plant business. Even here, however, the analyst will be wise to check the tentative plan with one or two units other

than those which served as "guinea pigs" during the earlier phases of the study.

How detailed the preparation for this initial clearance should be will depend on the importance of the contemplated changes. If a basically different method is being proposed, the analyst should try to obtain agreement on the fundamentals of the plan before working out the operating details. On the other hand, if the framework of the existing procedure is being retained, he should be prepared to discuss the recommended changes in complete detail during the initial review. For this purpose he may find it helpful either to prepare a skeleton flow chart of the revised procedure or to mark the contemplated changes on the chart of the present procedure. In this way, the "before" and "after" routines can be visualized and compared more readily by the operating personnel. The analyst's kit of materials for this presentation should also include drafts of new or revised forms, "after" layout charts, and all the important data on which conclusions were based.

This is the juncture in the procedures project at which the analyst's skill in handling the human relations phases of his work will begin to tell. How successful he has been in gaining operator confidence during the earlier parts of the study will have a real bearing on how his recommendations are received. How he presents those recommendations to the operator will tell the rest of the story. Here are some specific pointers on handling this second part of the job:

1. Approach the initial presentation with an open mind. Think of it more as an opportunity to *test* your ideas and less as a challenge to put them across. Be ready to modify them as weaknesses or better ways become evident.

2. Make the operator feel that you are presenting your material not as final recommendations but as *ideas for discussion.* Even on points that are well settled in your own mind, it is often wise not to convey the idea that you have reached definite conclusions.

3. With the possible exception of higher-level policy or organization matters, discuss all the proposed changes openly. Don't be mysterious about them. Tell the operator quite frankly what you are trying to do. By disclosing your own thinking, you will encourage him to exchange ideas with you.

4. Do not lose any opportunity to convince even a clerk that what you are doing is sound and beneficial to the company and

therefore to himself. Acquaint him with the anticipated results of the study so that he will see the changes affecting him as part of a broader purpose.

5. When objections arise—as they surely will—be sure, first, to hear the operating supervisor's arguments fully and to learn exactly why he thinks a given proposal will not work. Where necessary, set the point aside for further analysis or research. Then, if you are still convinced that the suggestion should be adopted, follow these steps:

a. Try to persuade the supervisor that it will work or, at least, that it is worth a trial.

b. If he still does not agree, concede the point provided it is not a major one and will not seriously interfere with the over-all plan. Compromises on small points will often help you win the larger ones. If you are reluctant, as a matter of principle, to make such compromises, you need only remember how frequently the operating personnel must adjust its ways to your ideas.

c. If agreement cannot be reached on a major point, explain as tactfully as possible that because the point has an important bearing on the whole program, you do not believe it should be abandoned without reference to a higher authority. At the same time, assure the front-line supervisor that you will present all the pros and cons of the case clearly and impartially. Write out his reasons for nonconcurrence and review them with him to ensure that they are a fair and complete statement of his position. (No matter how carefully this kind of a showdown is handled, a certain loss of good will inevitably result. For that reason it should be resorted to only when important gains are at stake.)

6. Finally, try to make the operating supervisor feel some responsibility for the success of the program. Ask for his help and advice in putting it across. Get his suggestions on how to slant the presentation at higher organization levels. Ask for his ideas on tackling the installation or on coordinating the new procedures more smoothly with related routines. Tell him that you would like to make the final presentation a product of your joint thinking.

GETTING EXECUTIVE APPROVAL

Once the proposal has been cleared with front-line personnel, the analyst should seek final executive approval as soon as pos-

sible so that the momentum gained during the program development phase can be carried through to performance results.

How high in the organization structure the proposal should be carried depends in each case on the number of departments affected and the importance of the changes to be made. As a minimum, each department head concerned should, of course, give his approval. If the recommendations involve major changes in procedures, a substantial investment in additional equipment, or a realignment of responsibility among departments, they should be carried up at least to the first executive having common authority over the departments affected. If they involve changes in organization structure or general policies or the dislocation of large numbers of workers, they would presumably be submitted to a general management executive for final approval.

The most important rule in preparing for the formal presentation is that both its form and content must be geared to the background and temperament of its recipients. How many of the executives to be consulted are aware of the problem? How much does each know about it? How important is it in relation to the other problems confronting him? How much interest does he have in matters of system and procedure? What arguments will appeal to him? What questions is he likely to want answered? How much factual information should be presented to convince him? Will he make decisions on relatively little evidence provided it is basic, or is he slow to move until a mass of evidence is placed before him? These are some of the questions the analyst must answer if his presentation is to stimulate interest and gain conviction at the executive level. Achieving these results may seem less important to him if he has succeeded in winning enthusiastic endorsement of his plan at the operating level. But he must remember that in every formal presentation he makes, he is weaving the web of his reputation with the executive group.

Form of the presentation. The second factor to be considered is whether the final presentation should be oral or written. Oral presentations may be made to executives individually or in groups. Written presentations may take the form of memorandums, comprehensive formal reports, or proposed standard practice instructions.

In general, the best results come from making the presentation orally to one individual or to small groups of two or three. This type of presentation, when skillfully conducted, produces more

warmth, understanding, and enthusiasm than the best written report. It is a more flexible type of presentation, offering the alert analyst an opportunity to sense executive reactions and revise his emphasis accordingly or to go into detail where the greatest interest seems to lie.

Under some circumstances large conferences are a quicker means of obtaining many approvals or of reconciling many points of view. Such meetings, however, should be used sparingly, for too often they inhibit action rather than stimulate it. They are difficult for the analyst to direct and control, they tend to crystallize opposition, and they encourage delay and "further study." For the most part, these complications arise because the analyst is not able to make his presentation in terms of each individual's interests and problems.

Although oral presentations are generally recommended, they are not always practicable or possible. Some type of written proposal must, of course, be submitted whenever the persons to be consulted are widely scattered geographically. Reports for this purpose should not only cover the recommended changes in detail but also anticipate and answer objections that might otherwise be answered verbally. Written presentations should also be used whenever the recommended program is so extensive that it requires much supporting evidence and careful point-by-point deliberation. In still other instances a standard practice instruction or memorandum will be sufficient when many elements of the proposal were discussed with executives and tentatively agreed upon during the survey and design stages. Here the written presentation simply brings all parts of the plan together for final executive authorization.

Even when recommendations are to be presented orally, the points to be covered should still be reduced to writing beforehand, much as if the presentation were to be made in report form. Preparing a written proposal forces the analyst to convert general ideas into specific recommendations. It helps him organize the presentation more logically, and it serves as an invaluable aid in drafting the installation instructions.

Content of the presentation. Within broad limits of variation in the amount of emphasis given to each, the presentation should usually cover the following subjects:

1. *Statement of the Problem.* This might be an explanation of

how the study originated, who requested it, and what its objectives were.

2. *Scope of the Project.* This might be expressed in terms of the functions or organization units surveyed, factors considered, experiments conducted, etc.

3. *Summary of Conclusions.* This should cover the major deductions that you have drawn from the evidence and used as the basis for your recommendations.

4. *Summary of Recommendations.* This should outline the principal changes proposed in each of the following areas:

a. Organization.
b. Policies.
c. Information requirements.
d. Procedures.
e. Methods and equipment.
f. Layout.
g. Personnel.

5. *Dissenting Points of View.* The presentation should indicate whether or not the operating personnel agrees completely with the proposal. If full approval was not obtained at that level, the disputed points should be specified, together with an impartial statement of the facts and opinions supporting both sides of the issue.

6. *Anticipated Results and Benefits.* These might include reduction in personnel requirements, elimination of overtime, space savings, lower equipment or supply expense, improved control, less processing time, fewer errors, etc. Potential savings of money or time should be estimated and an explanation given of how the estimate was made.

7. *Cost and Effects of Change-over.* Where the proposed improvement will require personnel changes, the nature of these changes should be described. The measurable costs of converting to the new procedures should also be outlined. These might cover the cost of purchasing or renting equipment, utilizing additional space, printing new forms, making layout changes, converting records, etc.

8. *Action Program.* This is a list of the specific steps necessary for putting the recommendations into effect. It is a plan for getting from where you are to where you want to be. As such, it is one of the most important parts of any final presentation, for by

charting a clear path to the desired goal, the analyst makes it easy for the executive to take action. Where some immediate executive authorization is desirable, the necessary memorandums, organization announcements, standard practice instructions, or other official notices should be prepared in advance so that the executive can be asked to sign them as a conclusion to the presentation.

Making the presentation palatable. If the analyst is to succeed in making people want to do what he wants them to do, he cannot rely solely on the soundness of his proposals. He must package them attractively. He must present them in such a way that they appeal to the imagination as well as to reason. Stressing this point, Dennison wrote: [1]

> Information may be accurate and important, but that alone will not make it stick; its form or content must in some way or other make an appeal. The presentation of facts or points of view in a form badly adapted to the hearers may set up in them defenses which will make acceptance forever impossible. The process of imparting information in such a way as to inspire some degree of enthusiasm is the process of gaining conviction. Convinced, persuaded, or, in business slang, "sold," a man reacts with more of his own energy than when merely "told."

Here are two steps the analyst can take to win this kind of response to his presentation:

1. *Highlight only the major points and make them easy to grasp.* Boil down, refine, and predigest the information to be presented. Begin with a clear, brief summary of the important recommendations and benefits. Instead of taking the reader or listener through the new procedure step by step, give him a concise picture of the principal differences between the old and the new. Then capsule all the changes in terms of the number of operations, forms, records, and reports that will be eliminated.

If a written presentation is to be made, try to write a telegram instead of a tome. Keep the body of the report as brief as understanding and conviction allow. If detailed procedure descriptions, "before" and "after" charts, statistical data, or other supporting evidence must be included, put them in the appendixes to the report. Or, as an alternative, state: "We have not included in this report many of the supporting details contained in our working papers.

[1] Henry Dennison, *Organization Engineering,* McGraw-Hill Book Company, Inc., New York, 1931, p. 113.

However, we will be glad to discuss this additional information with you to whatever extent you may wish."

2. *Get some drama and impact into the presentation.* Remember that, to the average executive, procedure mechanics are detailed, impersonal, and without much appeal. For that reason, real thought and skill are needed to make a presentation that awakens interest and generates enthusiasm.

One of the surest ways of dramatizing a procedures proposal is through the intelligent use of visual presentation techniques. Attention-getting charts, graphs, or pictures have been used widely and with outstanding results by advertising agencies in making program presentations. Since the procedures analyst must also be a "seller of ideas," he should be alert to the opportunities for applying the same techniques.

Visual aids need not be elaborate to be forceful. They need only convey an important set of facts or a fundamental idea simply and clearly. As an illustration, Figure 23 shows a chart that was used in one company to bring out vividly the extent of clerical duplication in the processing of a sales order. The major operations comprising the process are listed at the left; the points at which each operation was then being performed are indicated by the circles; and the number of different times each operation was performed appears at the right. The numbers within the various circles designate the sequence of operations.

After using this chart to point up significant facts about the existing procedure, the analyst covered it with a transparent overlay sheet containing colored stickers which had been positioned to cover up the operations recommended for elimination. This not only facilitated comparison of the "before" and "after" procedures but also dramatized the number of work-elimination possibilities.

Another useful technique for arousing interest is to express savings or benefits in fresh, new terms. For example, "Adoption of these recommendations will save the cost of preparing, handling, and filing half a million pieces of paper a year." Or, "Now the cost of processing one purchase order is $8.60. Under the proposed procedure, we believe that this cost will be cut to $6.00." Still other ways are to express savings not as absolute amounts but as a percentage of the cost of obtaining them or as a percentage of the cost of the activity studied.

One point of caution should be made about using any such tech-

OPERATIONS	BRANCH SALES OFFICES	SALES HEADQUARTERS DEPARTMENTS	CREDIT DEPARTMENT	ORDER DEPARTMENT	TRAFFIC DEPARTMENT	INVOICING DEPARTMENT	REGIONAL SALES OFFICES	PLANT SHIPPING DEPARTMENTS	ACCOUNTS RECEIVABLE DEPARTMENT	TABULATING DEPARTMENT	NUMBER OF TIMES OPERATION PERFORMED
1. EDIT AND COMPLETE CUSTOMER'S PURCHASE ORDER	(1)										1
2. TYPE PRINTED FORM COVERING THE SALE	(2) SALES ORDER (3) ACKNOWLEDGEMENT			(22) FACTORY ORDER		(50) INVOICE		(40) LOADING TICKET (45) SHIPPING NOTICE			6
3 ASSIGN SERIAL NUMBER TO THE FORM	(4) SALES ORDER	(11) FACTORY ORDER				(49)		(44) SHIPPING NOTICE			4
4 PROOFREAD TYPED FORM AGAINST SOURCE DOCUMENT	(5) (6)			(23)		(51)		(43) (46)			6
5 CHECK FORM FOR COMPLETENESS		(12) SALES ORDER (27) FACTORY ORDER		(20) SALES ORDER							3
6. REGISTER OR LIST INDIVIDUAL ORDERS	(7)	(13) CHRONOLOGICAL (28) BY SHIPPING DATE		(19)		(55)		(39)			6
7. SUMMARIZE ORDERS	(8)	(14)		(24)			(57)				4
8 MAINTAIN OPEN-ORDER FILE	(9)	(30) CHRONOLOGICAL (31) BY SHIPPING DATE		(25) (26)		(54)	(58)	(42)			8
9 CHECK CUSTOMER'S CREDIT			(17)								1
10 PRICE ORDERS		(15)									1
11 ESTABLISH SHIPPING DATE OR PRIORITY		(16)									1
12 ASSIGN ORDER TO PLANT				(21)							1
13 POST TRANSACTION TO CUSTOMER RECORD	(10) ORDER (34) SHIPMENT	(29) ORDER (62) INVOICE	(18) ORDER (73) PAYMENT						(68) INVOICE (74) PAYMENT		8
14. ENTER RAILROAD ROUTING ON ORDER					(32)			(41)			2
15 COMPARE FACTORY ORDER WITH SALES ORDER	(33)										1
16 MAIL ORDER ACKNOWLEDGEMENT TO CUSTOMER	(34)										1
17. CHECK PRICES	(59) ON INVOICE	(60) AFTER SHIPMENT (61) ON INVOICE									3
18 LIST SHIPMENTS	(35)							(47)		(70)	3
19 SUMMARIZE SHIPMENTS	(36)						(67)			(71)	3
20 MAINTAIN FILE OF SHIPPED ORDERS AND SHIPPING NOTICES	(37) (38)			(63) (64)	(65)	(52)		(66)			7
21 MAINTAIN FILE OF INVOICES	(60)					(53)			(69)	(72)	4
										TOTAL	74

Fig. 23. Chart Showing Duplication of Clerical Activities

niques to liven up the presentation. They must not be obviously dramatic or forced or artificial. If they are, they are more likely to provoke resentment or irritation than to quicken reception. Neither must they be so novel that they divert attention from the substance of the presentation. Above all, the analyst must be careful that in his effort to glamorize the results of his work, he does not overstate his case. Nothing will destroy confidence in his integrity more quickly than unsupported claims, sweeping pronouncements, or exaggeration of any kind.

Chapter 16

INSTALLING APPROVED PROCEDURES

No other phase of procedures work is so consistently haphazard and imperfect as that of putting approved plans into operation. It avails little, of course, that the plans are workable if they are not made to work. And yet, in the author's experience, more procedure failures result from muddled, slipshod installations than from any fundamental defects in the procedure itself.

There are two principal causes of this condition:

1. Procedures analysts tend to feel that they have accomplished their mission when the line organization has accepted their recommendations. By the time this point is reached, they have been through the often long and difficult processes of research, analysis, development, and persuasion. Once the victory is won, the tedium of implementation seems anticlimactic to them. They are more eager to meet the challenge of new problems than to buckle down to the prosaic task of threshing out operating details. And since procedures installation is more closely related to the operating function than to the planning or staff function, analysts are inclined to believe that responsibility for making the change-over cannot be separated from responsibility for operating the new procedure once it is in effect.

Line supervisors, on the other hand, are concerned chiefly with day-to-day operations. They do not usually have the time, or often the background, to carry out the approved program by themselves. The analyst forgets that the plan which he understands thoroughly may still be only a skeleton outline to the operator. And because of these limitations, an earnest beginning is too often followed by halfway measures, imprudent compromises, loss of enthusiasm, and finally a bogged-down program.

2. Soundly conceived procedures may be doomed to failure be-

cause the time and preparation required to install them properly are greatly underestimated. It is a safe generalization to say that the installation of most procedure changes takes more time and hard work than all the previous phases of the project combined. On a major study where the survey, analysis, development, and presentation work took two months, the installation might take six. It matters little that the new procedure, forms, records, and reports have been developed in complete detail, for these are still only a blueprint—a picture of your ultimate destination. As the previous chapter suggested, installation means getting from where you are to where you want to be. And the job of bridging that gap is often much greater than is generally realized. Forms and equipment must be ordered and their availability coordinated; operating instructions must be written and tested and the personnel indoctrinated in them; the new procedure must be refined and detailed points of operating mechanics settled; the cut-over must be planned; records must be converted; and preparatory changes must be made in related procedures. These are typical of the steps that must be planned and carried out in advance if the actual change-over is to be made without confusion, disruption of service, or a waste of the effort that went into the whole procedures study.

RESPONSIBILITY FOR THE INSTALLATION

It has already been implied that the analyst who developed the procedure should play a leading role in its installation. The nature of his participation, however, should change in midstream, that is, between the task of planning the installation and that of actually carrying it out. During the initial step of planning the change-over, he should retain the initiative. He should continue to spearhead the program, even though at this point the participation of line personnel will be greater than in any previous part of the study. In this way, installation planning not only benefits from his singular knowledge of the new procedure but it also serves as the means for transmitting his knowledge to the operating supervisor. It is the transition step between the analyst's leadership of the project and the assumption of that leadership by the line organization.

Responsibility for actually making the installation belongs, of course, to the line organization. During the change-over the analyst may continue to keep a close watch over progress and results

and to confer regularly with operating supervisors. But he has no direct authority over performance of the work except at the specific request of a supervisor who may consider it expedient to delegate such authority temporarily. Under this circumstance the analyst is temporarily accountable to his delegant, and his authority over the installation extends no further than the delegant's area of responsibility.

PLANNING THE INSTALLATION

The steps involved in the planning of a major procedures installation do not differ fundamentally from those outlined in Chapter 8 for the initial planning of the study. That is, the total job to be done must be broken down into its components, and each must be assigned and scheduled.

Timing the change-over. As a beginning point, decisions should be reached on three related questions concerning the time at which the cutover to the new procedure will be made.

1. Must the new procedure be inaugurated at a particular time? This requirement arises frequently when the changes to be made affect the basic character of the accounting system or any other activity that should be kept consistent throughout the calendar or fiscal year. Where an inflexible deadline must be met for these or other reasons, the dangers of confusion, breakdown, or excessive installation expense are greatest. Because the available time is invariably all too short, the preparatory work must be planned and scheduled with extreme care and its progress followed just as closely.

2. Should the entire procedure be installed at the same time or should it be installed in parts? This question is closely related to the first, since changes that must meet a specific deadline must also be installed wholly at that time. Where this requirement does not exist, however, the analyst usually has a choice between concurrent and successive installation.

If the changes are not of major importance or too great in number, they can usually be made simultaneously without danger of serious disruption. A complex series of changes, on the other hand, should ordinarily be handled progressively so that the installation is not jeopardized by too rapid a rate of change. Obviously if too many adjustments are undertaken simultaneously—either at one or several places throughout the organization—the supervisory force

cannot coordinate them properly or the work force assimilate them smoothly.

One simple but effective way of spreading the installation load is to separate those changes involving the elimination or combination of work from those involving new methods of operation. Usually changes of the first type can be made quickly and at a time when the installation crew is ordering forms and equipment, writing job instructions, and taking other preparatory steps. In this way much of the underbrush is cleared away and part of the operating personnel is freed to help with the changes still to be made.

Where the installation is undertaken one step at a time, the analyst must be careful that it does not spread over so long a period that momentum is lost or that the disruption or hardships accompanying the transition are unnecessarily prolonged. Another danger to be equally guarded against is the temporary loss of parallelism between related activities or transactions. In his article on the installation of a punched-card system, Chapin states: [1]

> [One argument for] making a clean break from the old system [is the] close interrelation of various records such as cash and accounts payable, accounts payable and distribution of expenditures, pay roll accrual and pay roll distribution. In other words, if certain data on punched cards represent a debit entry, it may be helpful to have the offsetting credit entry on punched cards also.

These dangers are real but they can be avoided. They do not argue against progressive installation so much as they emphasize the need for skillful installation planning.

3. The third question to be answered is at what point in the installation of the new procedure should the existing procedure be discontinued? As a protection against unanticipated problems or hidden weaknesses in the new procedure, should both the new and old be operated on a parallel basis for a given period? If not, should some parts of the old procedure be temporarily retained? Decisions on these points should be made early in the planning process, for they will materially affect the nature of the preparatory work, particularly in the selection and training of personnel.

In general, parallel installations should be avoided wherever possible, for they always mean added expense and often create delays

[1] Troy A. Chapin, Jr., "Some Problems of Installing a Punched-card System," *N.A.C.A. Bulletin,* Vol. XXVII, no. 3, 1945, p. 112.

in the processing of source documents. Again, skilled planning should greatly reduce the hazards of installation and the need for clinging to the old procedure. Trial installations are often advisable, but they can be confined to a small sample of the work so that complete duplication of procedure is avoided. As Chapin points out: [1]

> Should the test runs not have been conclusive, there is more reason to duplicate the work by continuing the old system for the first month or two, but under such conditions there may be a question as to whether the conversion should be made at that time or delayed until plans have been more completely worked out.

Planning the preparatory work. When these questions of timing the change-over have been decided, the next step is to determine what preparatory work needs to be done before the new procedure can be put into effect. This is essentially a job of listing all the measures that must be taken to equip and train the operating personnel for carrying out the new routine. One reason why so little time is usually allowed for performance of this work is that analysts neglect to think it through fully when the installation plans are laid. They either overlook important parts of the job or fail to break it down into sufficient detail to make realistic scheduling possible.

The inexperienced analyst can minimize these dangers by reviewing his approved procedure plan step by step and by asking the following questions about *each* of its *new* operations:

1. Is this operation described fully enough to cover every contingency, or does it need further testing, refinement, or amplification?
2. What new equipment, forms, supplies, work aids, or other clerical tools are needed to carry it out?
3. How much indoctrination will the worker need to perform the operation satisfactorily?

Fixing responsibility and scheduling the work. Having determined specifically *what* work needs to be done, the persons responsible for the installation should complete their plans by deciding *who* will carry out each step and *when* it should be started and finished. The analyst must let the operating supervisors make most of these decisions, for the installation timetable will be difficult enough to meet without risking the danger that they feel no responsibility for having set it up. Nevertheless, the analyst can be of real help to the

[1] *Ibid.*, p. 114.

supervisory force by urging that the following requirements be met when responsibilities are assigned and schedules prepared:

1. The key individuals on whom the success of the installation will depend should be relieved of enough other responsibilities to ensure adequate manning of the job.

2. Where no inflexible deadline must be met, the actual cutover should be scheduled to take place when the minimum of confusion will result. However well operations are planned and controlled, many departments have slack and peak periods during the month. These variables should be carefully studied when the change-over date is being set.

3. The timetable must be *realistic*. It must make allowances for obstacles, problems, delays, and unanticipated preparatory work. Above all, it must recognize the need for "staying in business" during the transition period.

Once the schedule has been drafted, the analyst should make sure that every person participating in the installation receives a copy. In addition, he will do well to make the key executives who are interested in the program aware of the estimated time required to complete the change-over. Persons who have never participated in a major procedures installation seldom realize the magnitude of the preparatory task. Unless they are told in advance what to expect, they are likely to become impatient over lack of results and to regard subsequent explanations as impromptu excuses.

Revising the schedules. As the preparatory work progresses, the need for additional preliminary steps often becomes evident. These should be incorporated in the formal installation schedule immediately so that they will not be forgotten.

If the preparatory work has not been completed when the installation date approaches, and if there is no deadline requirement, the change-over should be postponed and the remaining work rescheduled. Starting such installations under a handicap usually results in prolonged change-over periods, extra expense, excessive overtime, and undue strain.

One word of caution, however: every effort should be made to avoid repeated postponements. At best, they cause loss of enthusiasm and delay in realizing the benefits of the study. At worst, they raise doubts that the procedure is practicable or suspicion that it was poorly planned. Clearly the best protection against these hazards lies in developing the installation plan with great care, in following its

progress closely, and in taking whatever measures are necessary to keep it on schedule.

Hypothetical installation plan. The following hypothetical case suggests a format for recording the installation plan and illustrates the amount of detail required if the plan is to serve as a useful guide.

Plan for Installing New Order Processing Procedures

Action step	Responsibility of	Scheduled dates
1. Hold a series of meetings with the headquarters personnel concerned to outline the new procedures and the steps by which they will be put into effect.	Holmes Bates	5/2–5/4 5/2–5/3
2. Prepare and send to regional managers a brief outline of the approved procedures changes affecting the branch and regional offices.	Bates	5/4
3. Eliminate immediately the following records, files, and other clerical activities of the order department: *a.* Customer sales record card. *b.* Commission record. *c.* Duplicate file of open orders maintained by order schedulers. *d.* Manifest of orders released to plants. *e.* Duplicate editing of orders received from branch offices. *f.* Checking of unit prices on invoices to customers and maintenance of an invoice file. *g.* Preparation of daily summary of shipments by product class and sales region.	Holmes Gardiner	5/5 5/5–5/13
4. Determine the number of clerks who will be made available by the work eliminations listed in step 3 and arrange for their transfer.	Holmes Gardiner	5/6 5/6–5/13
5. Contact various suppliers of duplicating equipment, witness demonstrations, and visit companies using the equipment to determine the type and model that will best meet our requirements; issue the necessary purchase requisitions for the equipment and operating supplies.	Bates	5/5–5/20
6. Procure order schedule boards and sorting equipment for the order department.	Bates	5/9–5/13

Plan for Installing New Order Processing Procedures (cont.)

Action step	Responsibility of	Scheduled dates
7. Place order for visible reference panels and strips.	Bates	5/9–5/13
8. Discuss tentative designs of following new or revised forms with various forms printers, clear any changes with the operating supervisors concerned, and release the final designs to the purchasing department for ordering: *a.* Order-invoice duplicating master for factory shipments. *b.* Order-invoice snap-out set for shipments from branch warehouses. *c.* Customer master information card. *d.* Customer sales-statistical card.	Bates	5/16–5/27
9. Pending availability of new order-invoice duplicating master for factory shipments, have a supply of facsimile forms printed for use by the branch offices in place of the present order forms.	Bates	5/20
10. Order window envelopes and binders for new invoice form.	Bates	5/27
11. To ensure uniformity of order preparation, make a survey of the sizes of type face and the condition of typewriters in the branch offices, order and billing departments, and plant shipping departments. Plan the necessary shifts of equipment and initiate the purchase of any new equipment required.	Bates	5/31–6/10
12. Work with equipment suppliers to develop details of procedure for transmitting urgent orders to the factories by wire. Place orders for equipment and forms and arrange for training of personnel to operate the equipment.	Bates	5/31–6/10
13. Develop order department personnel program. *a.* On the basis of the revised plan of organization and division of work, prepare for the salary committee a definition and evaluation of each new or revised job.	Holmes Gardiner	5/9–5/11 5/9–5/20

Plan for Installing New Order Processing Procedures (cont.)

Action step	Responsibility of	Scheduled dates
b. Determine the number of persons required in each job. *c.* Reappraise the qualifications of the present personnel in light of the increased responsibilities of the job. *d.* Arrange any necessary personnel transfers. *e.* Select and train any new personnel required.		
14. Draft an organization announcement listing the new responsibilities of the order department.	Holmes	5/11
15. Instruct mail-room personnel to route to the order department instead of to product managers all purchase orders, branch sales orders, and correspondence relating to specific orders or shipments.	Holmes	5/12
16. Notify branch managers that their phone or wire inquiries about specific orders or shipments should be made to the order department instead of to product managers.	Holmes and Halverson	5/12
17. Discontinue the product managers' maintenance of the following records: *a.* Open- and closed-order files. *b.* Order-backlog record. *c.* Daily and cumulative record of plant production.	Holmes and Halverson	5/13
18. Develop policy covering the assignment of shipping priorities.	Holmes	5/16
19. Prepare instructions governing determination of the plant from which orders should be shipped.	Holmes	5/17
20. Write detailed job instructions for each of the following positions in the new order department: *a.* Order scheduler. *b.* Order clerk. *c.* Statistical clerk.	Holmes	5/18–5/20
21. Review these instructions with order department personnel, make any necessary modifications or additions to the instructions, and issue them in final form.	Holmes and Gardiner	5/23–5/25

Plan for Installing New Order Processing Procedures (cont.)

Action step	Responsibility of	Scheduled dates
22. Make the approved layout changes in the order department and move the credit and traffic departments into the adjacent area.	Holmes Gardiner Wade	5/26–5/27 5/26–6/4 5/30–6/4
a. Prepare final layout drawings.	Callahan	5/30–6/4
b. Reach agreement with the building superintendent on the tagging of furniture and equipment, the scheduling of partition and telephone changes.		
c. Initiate moving and rearrangement authorization.		
23. Work out the details of tying brokers' orders into the new procedure.	Holmes	5/31–6/3
24. Develop and carry out plan for transfer of customers' special packing, shipping, and invoicing instructions from headquarters to branch offices.	Holmes Gardiner	5/31–6/3 6/3–6/17
25. Expand the number of classifications into which order data are summarized for production planning and shipment-scheduling purposes.	Holmes Ryerson	6/6–6/10 6/10
26. Obtain from the credit manager a list of preferred credit risks and type this information on Linedex panel strips for use by order department clerks in checking orders.	Holmes Wade Gardiner	6/6–6/10 6/8–6/17 6/13–6/24
27. Work with credit manager on development of standard collection form letters and a standard mailing schedule.	Holmes Wade	6/6–6/10 6/6–6/17
28. Draft standard practice instructions covering the following procedures and clear them with the operating supervisors concerned:	Holmes Bates	6/13–6/14 6/13–6/24
a. Processing of orders and invoices covering factory shipments. This should include:		
(1) Distribution of order-invoice master.		
(2) Information to be added at each point.		
(3) Copies to be duplicated at each point and their distribution.		
b. Processing of order-change notices.		
29. Investigate any suggested revisions, points of disagreement, or areas of possible diffi-	Holmes Bates	6/23–6/24 6/20–6/24

Plan for Installing New Order Processing Procedures (cont.)

Action step	Responsibility of	Scheduled dates
culty brought out by the comments received on the draft of standard practice instructions in step 28. Revise the instructions, if necessary, and issue them in final form.		
30. Make a study of the elapsed mailing time via air mail and first-class mail between each of the company's plants and each branch office. Issue instructions to each plant specifying which service to use in mailing shipping notices to each branch.	Holmes	6/15–6/24
31. Set up for billing department pricing clerks precalculated charts showing invoice amounts for varying quantities of each product.	Holmes Mitchell	6/15–6/17 6/15–6/24
32. Draft a procedure instructions manual covering all operations of branch sales offices.	Holmes	6/20–6/22 6/27–6/28
33. Analyze the tabulating department's report schedule and determine the steps necessary to speed up monthly reports of shipments by branch office, product class, and customer.	Bates Holmes	6/27–7/15 6/29–7/6
34. Develop plans and make arrangements for installing the new procedures on a trial basis at the Philadelphia branch office.	Holmes Halverson	7/7–7/8 7/8
35. Develop standard unit time allowances for each clerical operation in the branch sales offices.	Holmes and Bates	7/11–7/15
36. Make pilot installation at Philadelphia branch according to the following sequence of steps: *a.* Explain new procedures to office personnel. *b.* Eliminate activities and operations not required under the new procedures. *c.* Convert existing records to their new forms. *d.* Make test runs of the new order-processing procedure using facsimiles of the factory and warehouse order-invoice forms.	Holmes Bates	7/18–7/22 7/18–7/29
37. On the basis of this pilot installation:	Holmes	8/1–8/5

Plan for Installing New Order Processing Procedures (cont.)

Action step	Responsibility of	Scheduled dates
a. Revise the branch office procedures instructions manual. *b.* Refine the standard time allowances for branch office clerical operations. *c.* Determine the required clerical complement for each branch under the new procedure by applying the standard time allowances to the branch's known work volume.	Bates	8/1–8/12
38. Develop installation program for other branch offices. This will include: *a.* A detailed list of all the steps that have to be taken to change over to the new procedures. *b.* The timing of each step.	Holmes	8/8–8/12
39. Make arrangements with representative of the duplicating equipment supplier to train machine operators for the order and billing departments.	Bates	8/15
40. Train a representative of each regional sales manager to assist the branches in his territory in installing the new procedures.	Bates	8/15–8/19
41. Send to each branch manager a copy of the standard practice instructions manual and the program for installation of the new procedures.	Holmes and Halverson	8/17
42. Issue memorandum of instructions to outside warehouses covering details of the new order-invoice procedure.	Holmes	8/15
43. Give to each order scheduler a copy of the order-preparation instructions issued to the branch offices.	Holmes	8/16
44. One week before adoption of the new order-invoice forms, issue instructions on the following points to the order, credit, traffic, plant shipping, and billing departments: *a.* Cutover dates. *b.* How to handle in-process orders which were originated under the old procedure. *c.* Potential problem areas requiring special supervisory attention during the transition period.	Holmes	8/18–8/22

Plan for Installing New Order Processing Procedures (cont.)

Action step	Responsibility of	Scheduled dates
45. Visit each of the branch offices to review progress of the installation, to assist with any problems that may have arisen, and to reach agreement with the branch manager on his required complement of clerical personnel.	Representatives of regional managers	8/22–9/16
46. During the first month that the new forms are in effect, make a 100 per cent audit of (*a*) invoices covering warehouse shipments and (*b*) order-invoice masters covering factory shipments.	Bates, Mitchell, and Gardiner	9/1–9/30

DOING THE PREPARATORY WORK

The nature of the preparatory work required on major procedures installations has already been indicated. The following paragraphs outline more fully the various types of work to be done and the objectives to be achieved in carrying out this part of the job.

Preparing personnel for the change. The first move in setting the stage for the change-over should be to recognize the personnel problems involved and to deal with them fairly, openly, and unhesitatingly.

This means, first, that decisions must be reached on what employee changes are to be made and how they will be handled. Here are some of the typical questions to be answered:

1. How many workers will be displaced by the new procedure?
2. Who specifically will they be?
3. Can some of them be transferred to other jobs without jeopardizing, in the long run, the benefits of the study? If so, which workers should be transferred and to what jobs?
4. How many must be released? Who will they be?
5. What will be done to minimize the hardships of their release? What will our policy be on termination pay? How can we help them find jobs elsewhere?
6. How many employees must be trained to perform work requiring new skills? Will the evaluation of their jobs be affected?

Second, every effort must be made to develop favorable employee attitudes toward the change before it is installed. Once decisions

are reached on a major procedures problem, its human relations phases tend to be sidetracked by its technical aspects. But the analyst must remember that, even where a skillful job has been done in earlier parts of the study to promote understanding and interest, the employee's greatest concern is over the decisions finally reached and how they will affect him. If he must await the actual change-over before learning what these decisions are, the gains already made in winning his acceptance are likely to be unnecessarily lost. Even where some employees will be displaced by the change, there is less risk and greater profit in disclosing your plans to the work force promptly and openly than in seeking to "protect" its members until you are ready to move.

In the first place, rumor flourishes where knowledge and understanding are missing. And under these circumstances, the imagined consequences of a contemplated change are inevitably much worse than they actually turn out to be. Thus, needless uncertainty and unrest can be prevented by a frank and early discussion of the facts.

A second reason for outlining the proposed course of action in advance is that by doing so you give the employees an opportunity to think about it, discuss it, and become accustomed to it. Having made the necessary mental readjustment by the time the installation is begun, they are likely to take part in it with greater acceptance and enthusiasm.

Finally, nothwithstanding the effects of a change, when employees feel that nothing has been hidden from them, they are also more likely to feel that they have been dealt with fairly. Even where some releases are necessary, skillful handling of the situation can convert an apparent liability to employee morale into an asset. A forthright acknowledgment of the problems plus a clear explanation of what will be done to minimize the hardships of displacement can have an incalculably favorable effect on employee attitudes throughout the whole organization.

Most of what should be covered in this initial explanation to the work force has already been implied. It is not necessary to describe the new procedure in complete detail since that will be done later during the employee-training phase of the preparatory work. The objective at this point should be to outline:

1. The major features of the new procedure.
2. The reasons why the changes are being made.

3. How and over what period of time the installation will be made.
4. The effect of the new procedure on manpower requirements.
5. The steps the company has taken and will take in the interests of employees affected by the change.

Testing the new procedure. A second important preparatory requirement is to make sure that the new procedure meets the tests of actual operating conditions. This can be done in either of two ways: (1) by putting a sample of actual work through the planned operations; (2) by converting fully to the new procedure in one of several like units of an organization while the other units continue operating under the old procedure. The latter type of trial operation is usually referred to as a "pilot installation."

Preliminary testing by either of these methods has many values, the net effect of which is to take the panic out of a major installation. The most obvious advantage, of course, is that testing enables the analyst to settle many minor details previously overlooked and to make certain that the new procedure will meet every operating contingency. It also serves as a means of checking the completeness and intelligibility of new forms and written instructions. In addition, where extensive changes are to be made in many similar groups throughout the company, a pilot installation provides the best opportunity for training the installation crew. On changes limited to one area, the testing process can usually be combined with the worker training program either by using actual work or transcripts of it. A further advantage is that performance of the new routine under real or simulated conditions permits unit time allowances for each operation to be refined so that labor savings can be determined more precisely. It also frequently points the way to additional short cuts and improvements that can be incorporated in the procedure before its inauguration. Finally—and this is perhaps of greatest importance—a successful test run supplies the confidence needed to ensure a quick, smooth installation.

So much for the benefits of pretesting. Now let us look at some practical aspects of carrying it out. Here are three rules that will help the analyst get the maximum results from this part of the preparatory work:

1. Treat the preliminary tryout just as you would the actual installation. That is, conduct it as a tightly controlled experiment.

Be thoroughly prepared before starting. Make sure that everyone knows in advance what is expected of him. Assemble all the necessary working tools, supplies, instructions, and forms or duplicated facsimiles. Simulate actual working conditions as closely as possible. Unless these precautions are taken, many of the important points, which the test should bring to light, will be lost in the casual, slipshod method by which it is conducted.

2. If the test is being made by the sample method, be sure that the transactions represent a cross section of the varying conditions that will have to be met when the procedure is in actual operation. Include a number of the more difficult, nonstandard cases; for, in designing a new procedure, analysts tend to concentrate on the normal routine without giving too much attention to that small part of the work requiring special handling.

3. Give a great deal of thought to selecting the unit in which a pilot installation is to be made. Try to pick a group that has a reputation for open-mindedness and willingness to adopt new ideas. The other units will be watching the experiment closely, and their attitude toward the change will be very much influenced by the attitude of those who first install it.

Designing and ordering forms. As soon as the testing process is finished, any new or revised forms required under the contemplated procedure should be designed in final form and ordered from the printer. If, as a result of the trial run, the original designs were substantially changed, it is wise to clear the final drawings with the operating supervisors concerned so that the cost and delay of further alterations in the printer's proofs can be avoided. This is also a logical time to reach decisions on the disposition to be made of superseded forms and to arrange for their recall.

Obtaining equipment and rearranging facilities. If changes or additions in office equipment are to be a part of the program, the project recommendations often will not have gone beyond specifying the type of equipment needed. Where this is true, an important part of the preparatory work will be to decide the exact make, model, capacity, and quantity of equipment to be obtained.

If more or less floor space will be required under the new procedure, if the location of a department is to be changed, or if equipment and machines are to be rearranged, as many of these changes as possible should be made before the installation so that quarters and facilities are ready in advance. The preparation of

physical facilities should also include the efficient arrangement of such apparently minor items as work tables, racks, cabinets, etc., for these items often play an important part in securing smooth installations.

Preparing work aids and procedure instructions. The various codes, tables, charts, indexes, wiring diagrams, and other work aids required under the new procedure should be prepared early enough to allow time for testing them before the change-over is made. Preparatory measures of this kind are often put off until they overlap the installation, thereby causing delay and confusion during its initial stages.

One of the most demanding problems in launching a new procedure is translating a general plan of action into a form and language that can be readily understood by the persons upon whom success of the plan depends. All too frequently analysts assume that this requirement is met simply by drafting standard practice instructions covering the new procedure. Although this is the first prerequisite, it is still only part of the job. It tells only what operations are to be performed *after* the installation is completed. It is like giving the workers a new and unfamiliar goal without telling them how to reach it.

On a major change-over, therefore, instructions on the steps to be followed *before* and *during* the installation are as important as those covering the ultimate procedure. Specifically, the following subjects should be covered:

1. The preparatory work to be done by the operating personnel.
2. The procedures to be followed during the transition period. If thoroughly prepared, these instructions are often more elaborate and detailed than those covering the new procedure itself. They should include such matters as the time at which to discontinue each part of the old procedure, the method of handling transactions that were started under the old procedure and are still in process when the cutover is begun, the provision of special checks and controls during the critical phase of the conversion, and so on.
3. The procedure and organization structure that will be in effect when the installation is finished.
4. The effect of the new procedure on departments that will not participate in it directly. For example, changes in a cost accounting or payroll function may be of concern to a foreman even though he plays no part in its performance.

In preparing such instructions, the analyst will do well to err on the side of imparting too much rather than too little information. He must remember that because of his long exposure to the problem, his mind supplies many of the minor details with which others are not familiar. A set of instructions that seems complete and understandable to him may have many gaps to the operating personnel.

In a procedure involving many departments, the usefulness of written instructions can also be increased by preparing the instructions in separable sections so that each group can be given only the material with which it is concerned. In some instances the analyst will want to go even beyond this point and prepare detailed breakdowns of individual jobs.

Finally, provision should be made for distributing copies of the instructions to everyone affected by them. One of the common deficiencies here is to prepare only enough copies for the department heads concerned. The result is that relatively little written information reaches the great group of clerical personnel upon which management must depend for efficient execution of its policies and plans.

Other suggestions for the preparation of written instructions and the development of procedures manuals are given in the next chapter.

Training the personnel. In most cases, the job of indoctrinating workers in the new procedure cannot be satisfactorily done just by the issuance of written instructions. Although such material forms the basis for indoctrination, it is still only a guide, a reference device, or a set of rules. If the instructions are to be properly executed, they must usually be supplemented by some sort of follow-up, encouragement, or training of supervisors and workers. This might take the form of group discussions, demonstrations, on-the-job coaching, or practice sessions during and after the testing of the procedure.

The amount of training required will be slight in some cases and great in others, but the need will be present in practically all. Where simple changes are to be made, the process of education will be simple. Under these circumstances a brief group meeting ordinarily will suffice. But where many or radical changes are to be made, a more elaborate and carefully planned training program of several weeks' duration may be needed. This is particularly true of projects involving the introduction of an electronic computer or of tabulating,

bookkeeping, or other office machines that require specialized skills in their operation.

An important point to be borne in mind is that training should not be limited to the mechanics of the work, for enthusiastic and intelligent performance will depend just as much on an understanding of the broader aspects of the plan. Each employee should be helped and encouraged to understand the objectives and principles involved as well as the manner in which his job fits into the whole routine. A scheduling clerk, for example, should be told how the anticipated changes in a production-control system will help shorten the production cycle and reduce inventories. Employees who are being retrained to operate a new electronic computer or tabulating-machine installation should be taught the relationship of their work to the whole accounting system and the part that each basic type of machine plays in the whole process. It is easier for the trainee to learn the operation of a specific machine if he knows the fundamental principles of punched-card accounting. A further advantage of this broad approach is that it helps the worker understand the effect his errors or delays will have on subsequent parts of the procedure.

Against this background, each operator should then be fully instructed in the work he is to perform. Next should come a period of actual practice, accompanied by periods of discussion. The amount of time given to this part of the training will vary, of course, depending on the degree of change, the type of equipment to be used, etc.

A word is needed here about responsibility for the training program. In general, the workers should be trained by their own supervisor, who, in turn, has been indoctrinated in the new procedure by the analyst. This arrangement not only reflects supervision's intrinsic responsibility for worker education but also equips the supervisor to make better decisions during the installation period and to keep the routine adjusted to changing requirements thereafter. Exceptions to this rule may occur when a tight deadline must be met or when highly mechanized operations are to be adopted. Under these conditions, the supervisor would presumably delegate much of the training job to outsiders, including the analyst and a representative of the equipment manufacturer.

Revising related procedures. Any required revision in auxiliary routines, which feed into the main procedure, should be planned and made before the key changes are installed. This spreads the work

and provides a chance to iron out minor difficulties before the larger job is taken.

The same principle can often be applied to activities that follow or depend on the main procedure. For example, the forms of various reports can sometimes be changed before their preparation under the new plan is actually begun. This may permit an allied procedure, which depends upon these reports, to be revised first.

Making preparatory change-overs. As a conclusion to this section it is safe to say that any work that can be done before the installation should be placed on the preparatory schedule and not left for the installation schedule. Study will show many items of this kind. Records may be transferred or converted in advance, partial routines may be established, control systems set up, files rearranged, etc.

MAKING THE INSTALLATION

Assuming the intrinsic soundness of the new or revised procedure, the success of the project will be assured if the preparatory work has been done with skill, foresight, and thoroughness and if the installation is made under calm, capable supervision.

The following paragraphs contain a number of suggestions and cautions on this final step of putting the procedures plan into operation.

Keeping on schedule. Since unexpected problems and troubles frequently develop, the actual installation seldom proceeds as smoothly as planned. And when these difficulties arise, they tend to divert attention from the original plan and to provide excuses for delay. To prevent this occurrence, the progress of the work must be vigilantly watched, especially during its initial stages; for if any lagging behind schedule is permitted to go unremedied, its effects are likely to be cumulative and to increase the difficulties experienced at other stages. One qualification, however, is that you should not let your zeal for keeping on schedule force you into beginning a new step until any preceding steps on which it depends have been satisfactorily completed.

Omitting planned features. In the stress of installation there is a tendency to do without certain features of the original plan, to ignore parts of the instructions, to leave apparently minor things until later, or to get along without certain facilities. This danger should be

guarded against, for in all likelihood these items were included to facilitate the whole program. Their omission only serves to increase the problems later on.

Making emergency decisions. One of the most common requirements during a large-scale installation is the issuance of supplementary orders when the regular instructions do not cover a particular situation. Obviously such decisions should not be made without thorough consideration of all phases of the problem, even though the work in question must be temporarily set aside.

In manning the installation organization, it is well to station qualified supervisors or advisers at strategic points so that these wrinkles can be quickly ironed out. Needless to say, the persons selected must have a full knowledge of the principles and objectives of the procedure and an ability to visualize the effects of their decisions on other parts of the plan.

As emergency decisions of this character are reached, they should be made known to everyone affected. In addition, the change should be recorded on a master copy of the procedure instructions so that the whole structure will be kept in balance.

Making in-process changes. Closely related to the need for issuing supplementary instructions is that of polishing or refining the original procedure as operating experience reveals opportunities for further improvement. These opportunities should be exploited immediately if doing so will not materially slow down the conversion. If it will, they should be set aside until the more important parts of the procedure are being performed satisfactorily.

Occasionally an installation will strike such a serious obstruction that the procedure will have to be basically changed. Should this happen, the installation work should not be stopped immediately, for it will often be found that the problem is not so grave as originally thought and that much of the work can be salvaged.

Summary. Here in summary form are 10 guideposts that will help to keep the installation team out of trouble:

1. Be ready before starting.
2. Keep up to schedule.
3. Avoid rash, emergency decisions.
4. Anticipate and eliminate crises.
5. Don't let minor kinks dampen your enthusiasm or your confidence in the plan.
6. Keep all phases of the change-over coordinated by informing

executives and supervisors promptly of any changes in the original procedure or the installation plan.

7. Prevent dissension among the personnel.
8. Don't require continuous or excessive overtime work of the installation crew. If the change-over is falling significantly behind schedule because of lack of personnel, get some extra temporary help.
9. Avoid disruption of service.
10. Don't sacrifice thoroughness for speed.

INSTALLATION FOLLOW-UP

Even when the new procedure is in operation and the installation is considered complete, the job of the analyst is not over. One of his important continuing responsibilities is a systematic follow-up to ensure not only that the gains originally planned are realized but also that they are held or furthered.

This function has two parts: (1) a thorough checkup shortly after the installation to see that the change is stabilized; (2) a longer-range program of periodic audits to ensure that the procedure is properly maintained.

The initial follow-up step should be thought of as continuing until all phases of the new procedure are fully in effect and operating satisfactorily. Where the change-over is relatively simple, this review may be considered part of the installation work and made as the final step in that process. Where widespread changes have been made, however, a certain period of operation is required before the new procedure is shaken down and ready for review. Thereafter, continuing follow-up may be needed over a relatively long period of time before the desired results are achieved.

Follow-up objectives. The analyst should develop his plans for the installation follow-up in terms of these objectives:

1. To ensure that all parts of the new procedure have been put into operation and that the written instructions are being adhered to.
2. To make any further modification or refinements for which operating experience reveals the need.
3. To measure the results achieved against those originally predicted and to take whatever action is necessary to get the maximum benefits from the new procedure.

Points to be checked. Following is a check list of the major points to be covered in reviewing the newly installed procedure. The thoroughness of the check will vary from point to point in any particular review. In some areas, a quick visual inspection will suffice; in others —particularly where difficulty was experienced during the installation—a detailed audit of the work will pay dividends.

1. *Elimination of Old Procedures.* Make sure that no parts of the old procedure are being continued unintentionally. Where two procedures have purposely been operated in parallel, make whatever tests or comparisons are necessary to satisfy the executives and supervisors concerned that the new procedure can safely replace the old.

2. *Effectiveness of the Procedure.* Study the over-all operation of the procedure to see if the objectives for which it was designed are being achieved. For example, are reports being prepared in the prescribed manner and being submitted on time? Also, check to see whether or not all new services and reports are being fully utilized. If not, further educational work may be desirable to explain their use, form, or purpose, or certain parts may be eliminated.

3. *Operating Expense.* Wherever expense reduction is among the project objectives, check the savings actually realized against the estimate made as part of the project proposal. There is a tendency to delay in taking advantage of the expense reductions that a new procedure makes possible. This applies particularly to excess manpower. Where you find this condition exists, determine the reasons for the delay and work out with the appropriate executive or supervisor a specific timetable for realizing the balance of the savings.

4. *Procedure Instructions.* Check the written instructions on the procedure in sufficient detail to see whether or not they are being followed. If not, find out the real reason, whether it is indifference, misunderstanding, failure to receive copies of forms or instructions, insufficient follow-up or coaching by the supervisor, unworkability of the instructions, etc. Having determined the cause, you can then decide whether further training, better supervision, or other corrective measures are needed, or whether the variation is justifiable and should be incorporated in a revised set of instructions.

During this part of the review, ask those who are engaged in the work for their suggestions on further refinement or improvement.

5. *Clerical Performance.* Check the quantity and quality of work produced against the performance estimates made in the original proposal. If performance is not up to standard, work with the super-

visor to develop a plan for increasing production or realigning the work force. Where the written instructions call for the maintenance of clerical production records, check to see that these are being properly kept and utilized.

Also, as part of this step, check the presence and use of controls over accuracy of the work. These devices are of particular importance during and just following the installation, for they frequently provide the only reliable means for detecting errors in performance or failure to follow the procedure.

6. *Facilities.* Make sure that all the prescribed facilities, supplies, and work aids are available and that they are being used as planned. Check the layout of the office against the original diagrams and determine whether the anticipated reduction in movement or backtracking has been realized.

Improvement programing. Following each such review of the installation, the analyst should prepare jointly with the line supervisor a definite program of steps to be taken and results to be accomplished before the next review. This process should be continued until no change-over work remains and the procedure is considered satisfactory. Under this arrangement, the first step in each subsequent review is to see that everything on the previous improvement program has been done.

A written program of this type should also be prepared at the end of the formal installation work to serve as a guide during the period before the first scheduled review.

SUBSEQUENT OPERATING AUDITS

The study of a given procedure should not be regarded as coming to an end when the changes have been fully installed, but rather as the beginning point of a development process that will continue indefinitely. Inefficient or unnecessary steps will creep back into the procedure. New personnel, not fully aware of the purpose behind the activity, will take over its performance. The basic requirements to be met will change. New equipment or techniques will open the door to further improvements. For all these reasons the postinstallation review should be followed by regularly scheduled audits to make certain that effective operation of the procedure can be and is being continued.

This continuing review should be a responsibility of the procedures staff, for in this way the staff is given an instrument to influence the

final effectiveness of procedures work. Frequently, however, the staff will find that its efforts can be multiplied by calling on the internal auditing staff to make the actual review. Where this is done, both groups should work closely together in scheduling the reviews, in developing a detailed check list of points to be covered, and in reviewing the results of each audit.

Chapter 17

DEVELOPING AND MAINTAINING PROCEDURE INSTRUCTIONS MANUALS

However well procedure instructions are communicated to the operating personnel during the installation period, they must generally be codified if they are to have a durable effect. The small, closely knit organization may be able to rely on oral communication and direction just as the communal needs of a primitive social group are met by unwritten tribal customs. But the large far-flung enterprise can no more be managed effectively without written instructions than a modern nation can function without legislative statutes. The form in which these instructions are recorded may vary from simple memorandums or bulletins to highly formalized policy and procedure manuals. But whatever the form, some type of written communication is needed if the following objectives are to be fully achieved:

1. *To Force Decisions on Policy and Procedural Details.* Or, as Conarroe puts it: [1]

> . . . To definitize and clarify a situation. . . . The very process of converting a policy or a procedure to writing in concise and understandable form necessitates a decision on questionable and indefinite points. Take the question of seniority rights for instance. It is a simple matter to make the general statement that the company recognizes length of service in its promotion program. But when it becomes necessary to prepare a formal write-up of this policy that can be uniformly applied throughout the organization, it is necessary to consider carefully the various conditions and restrictions to be met. For instance, there is the application of seniority to questions of layoff, reemployment, promotion within departments or between departments, retirement benefits, etc. The process of preparing a

[1] E. H. Conarroe, "Preparation and Use of Office Manuals," *N.A.C.A. Bulletin,* Vol. XXIV, no. 19, 1943, p. 1196.

formal, workable statement of policy on this point will bring many of these questions to the surface.

A corollary advantage to the one Conarroe cites is that written procedures eliminate areas of disagreement. We have all had the experience of reaching apparent agreement with others on policy or procedure questions only to discover later that, because the decision reached had not been pinned down in writing, it was being interpreted in widely different ways by those who had helped to make it.

2. *To Facilitate the Training of Clerical and Other Administrative Personnel.* Written instructions help to reduce the time and cost of absorbing new personnel into the organization or of transferring old employees to different jobs. Particularly during periods of business expansion, high labor turnover, or rapid change in the nature of operations, clear, specific procedure or job instructions unquestionably are a valuable supplement to the training efforts of overburdened supervisors. Such write-ups eliminate the need for infinite repetition of instructions. At the same time they ensure that the employee gets all the details of the accepted, standard procedure and not just those the supervisor remembers to tell him.

3. *To Promote Uniformity of Understanding and Performance.* In a multiple-plant or multiple-branch company, written instructions promote orderliness, certainty, and consistency of action in performance of the same routine at all points. Even in a centralized organization, written instructions help to ensure uniformity of policy interpretation among the many persons participating in an interdepartmental procedure. Without a written guide to refer to when questions of policy or procedure arise, variations in practice are bound to develop and to lead eventually to confusion, neglect, and ineffective administration of policies.

4. *To Spread Knowledge of What Is Done Elsewhere.* In a large organization, coordination is obviously improved as each group understands not only its own limited operations but also the activities and requirements of the groups on its horizon. One way of spreading this knowledge is the development and maintenance of a general standard practice instructions manual.

5. *To Establish the Basis for Control.* If a new procedure is to remain effective, it must not only be adjusted to changing conditions but also followed consistently by the operating personnel. This reemphasizes the importance of the periodic follow-up or operating audit discussed in the previous chapter. But if such audits are to be

made, the auditor must have some way of measuring what he finds. Thus another important purpose of written instructions is to provide the basis for checking compliance—that is, for controlling and enforcing procedures once they have been installed.

6. *To Preserve the Experiences of the Organization.* The operating experience gained by the members of an organization is, in part, the property of the company. Certainly, at least, it is one of the company's greatest intangible assets. And if this asset is not to be wholly dissipated by personnel turnover, the experience of individuals must be codified and passed along. In this way, others can take up the work of improvement where their predecessors left off instead of having to start all over again. Thus written practices are like ratchet wheels—they permit forward motion but prevent slipping back. They are, in military parlance, a way of consolidating your gains before moving on to the next objective.

7. *To Facilitate the Examination and Revision of Procedures.* An up-to-date instructions manual simplifies the study of existing routines and therefore encourages continuous evaluation and improvement of procedures. Moreover, the manual provides a means for publishing procedure revisions in an orderly, uniform way. It ensures that everyone affected by a change will be told about it at the same time and will know that it has official sanction.

8. *To Facilitate Setting Up New Units.* Whenever a company opens a new plant, store, or branch office, much delay and trial-and-error experimentation can be avoided if those in charge of the unit have a definite set of guidelines by which to operate. This not only hastens the establishment of tested methods and procedures but also enables the local management to concentrate on the broader, nonroutine aspects of the new undertaking.

WEAKNESSES OF PROCEDURES MANUALS

In spite of these values, many companies have done only a mediocre job of maintaining up-to-date, useful procedure instructions. On this point Urwick writes: [1]

> It is not reasonable to anticipate that the members of a large organization will regard coordination as of great importance, or indeed develop any marked respect for the wishes of those in authority, if the *form* in

[1] L. Urwick, *The Elements of Administration,* Harper & Brothers, New York, 1944.

which those wishes and the consequent arrangements are expressed is not itself orderly, coherent, definite, timely, and easy of reference. And yet, in a great number of undertakings of all kinds, written instructions are neither uniform, clearly expressed, self-consistent, readily amendable, logically arranged, nor up-to-date. Either little or no attention is given to the question of publication of information or too much attention is given to it by too many people. There is no central control, and subordinate officers become enmeshed in a chaos of regulations which defy interpretation while providing a thousand avenues for circumlocution.

Anyone who has ever had to use procedure instructions manuals will vouch for the truth of what Urwick says. Probably the two criticisms heard most frequently are that such publications are neither dependable nor easy to understand. Too often after a manual is launched with resolution and enthusiasm, it is allowed to drift and thereby become obsolete and discredited. Too often the job of preparing the manual is entrusted to those who are either unskilled in written communication or insensitive to the needs of their audience. The product of their effort is often cumbersome, prolix, poorly arranged, and unintelligible.

The remainder of this chapter discusses the elements of a complete manuals program and suggests a number of steps that will help to ensure spontaneous adherence to written instructions.

THE STRUCTURE AND SCOPE OF COMPANY MANUALS

The written instructions of most companies fall into the following four classifications:

1. *General or Company-wide Instructions.* These contain the rules, regulations, and routines that every supervisor needs to know regardless of the function he supervises. They include general policies (mostly on personnel matters) and the procedures which may be initiated by any supervisor. Examples are how to hire, transfer, or release employees; how to obtain petty cash funds or account for employee expenses; how to initiate miscellaneous, nonproduct shipments; etc.

2. *General Instructions of a Technical Nature.* These are usually aimed at achieving uniformity of practice on a specialized activity cutting across the whole company. They may include lists of standards (such as a standard office equipment and supplies manual); detailed job instructions covering the same position in many departments (such as a stenographer's or a filing clerk's manual); and tech-

nical information of general interest (such as the classification of accounts or a salary administration manual).

3. *Interdepartmental Instructions.* These cover the procedures that are always initiated by the same department but that flow through one or more other departments.

4. *Departmental Instructions.* These are limited to policies and procedures that concern the supervisors of only one department. Such instructions might cover either individual jobs or routines affecting several sections of the department.

Although there is by no means complete uniformity in the way these written instructions are issued, probably the most common practice in large industrial organizations is to publish three types of manuals—one covering general and interdepartmental policies and procedures; one, departmental matters; and one, technical instructions. Under this arrangement each supervisor ordinarily has at least two manuals on his desk—a company-wide manual and his own departmental manual.

This division in the structure of manuals has two advantages: (1) It corresponds to the responsibility for developing manual material. (2) It keeps each supervisor from having to read much information not related to his job. At the same time, however, it has certain dangers. Many departmental instructions do little more than amplify the responsibilities assigned to each department in a general standard practice instruction. The two manuals, therefore, must be closely coordinated to avoid inconsistency or lack of coverage on important points. Chapter 3 pointed out many of the weaknesses and problems in a departmental approach to the improvement of interdepartmental procedures. Many of these same difficulties arise in the maintenance of a dual structure of manuals. In some instances, the scope and release dates of general and departmental instructions on a common subject may not be properly coordinated. In others, departmental instructions may conflict with statements of policy or assignments of responsibility appearing in general instructions. In still others, departmental instructions may exceed their jurisdictional limits and apply to positions outside the department.

Two steps can be taken to minimize these dangers. First is to publish a clear, written definition of the scope of each manual and the relationship between manuals. This, by itself, will do much to maintain a well-integrated structure. Second is to provide some means of ensuring that each set of new or revised instructions remains within

the scope of the manual in which it is published and does not conflict with instructions already in effect.

Following is a statement of the scope and purpose of one company's general instructions manual:

I. Scope and purpose of this manual
   A. The company's general standard practice instructions manual contains the following types of information:
      1. A statement of the company's objectives.
      2. Statements of company policy on matters relating to all divisions.
      3. Descriptions of procedures which may be initiated by any company supervisor, including instructions for preparing and routing all commonly used company forms.
      4. Descriptions of all procedures in which the personnel of two or more divisions participates. These do not include the divisional or departmental detail, but assign responsibility by departments for performing the various steps in each procedure and specify the sequence and timing of these steps.
      5. Regulations governing the use of company services and facilities.
   B. These instructions and information are designed to achieve the following objectives:
      1. To promote common understanding of company objectives.
      2. To ensure uniformity in the interpretation and administration of company policies.
      3. To assist in coordinating the activities of the various divisions, departments, and sections of the company.
      4. To provide the basis for effective management control of company activities through provision of standards against which actual performance can be measured.
      5. To aid in training members of the organization.
      6. To encourage constant review, improvement, and simplification of procedures.

This statement of scope and purpose appears at the beginning of the manual in a set of instructions entitled "Introduction to the General Standard Practice Instructions Manual." The next set of instructions, entitled "The Company's System of Manuals," outlines the scope and relationship of the several other manuals used throughout the company. The first five sections of these instructions are reproduced in Figure 24, which is adapted from material in "A Practical Manual of Organization" by R. E. Gillmor.[1]

[1] *Reading Course in Executive Technique,* ed. by Carl Heyel, Funk & Wagnalls Company, New York, 1948, Sec. I, Bk. 4, pp. 53–56.

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Subject THE COMPANY'S SYSTEM OF MANUALS

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II. COMPANY-WIDE MANUALS

III. DIVISIONAL AND DEPARTMENTAL MANUALS

IV. RESPONSIBILITY FOR DEVELOPMENT AND MAINTENANCE OF MANUALS

V. AUTHORITY FOR ISSUANCE AND INTERPRETATION

VI. COORDINATION OF GENERAL AND DEPARTMENTAL INSTRUCTIONS

I. GENERAL.

A. The Company's system of manuals consists of several sets of written instructions and information on policies, procedures, responsibilities, and standards which are prepared and approved by positions of recognized authority. Each set of instructions is issued in a binder to the supervisory personnel and, in some cases, to the operating personnel whose activities the manual governs.

B. The structure of Company manuals can be divided into two major classifications: (1) manuals that govern the entire Company, and (2) manuals that govern only the activities of one division or one major department.

Fig. 24. Description of One Company's System of Manuals

STANDARD PRACTICE INSTRUCTIONS	Page	Classification Number
_____ Company, Inc. _____ New York	2 of 5	1.A.2

II. COMPANY-WIDE MANUALS.

Following is a description of the content and purpose of each manual applying to all personnel throughout the Company:

A. General Standard Practice Instructions Manual. See statement of scope and purpose in SPI 1.A.1, "Introduction to General Standard Practice Instructions Manual."

B. The Organization Manual contains charts of all supervisory positions within the Company showing the title and organization number of each position, the name of the person holding the position, and the relationship between positions. The Manual also contains a definition of the responsibilities of each such position and the responsibilities common to all positions. This material is designed to promote efficiency and unity of operation by defining for each supervisor the exact boundaries of his own position and the boundaries of every other position with which he must cooperate.

C. The Salary and Wage Administration Manual contains approved occupational titles and definitions of salaried and hourly occupations. Occupational definitions or specifications consist of a statement of the duties, skills, and experience required in the occupation. The Manual is used as an aid in selecting applicants for jobs, in establishing salary ranges, and in determining eligibility for promotion.

D. The Standard Equipment Manual contains purchase specifications for office furniture and equipment and other capital items which can be used interchangeably between divisions and which have been standardized for purposes of economy and uniformity of appearance.

E. The Secretary's Manual contains selected General SPIs and other instructions regarding preparation of correspondence, filing, the interoffice mail system, and related subjects. This Manual is issued for the training and guidance of all secretarial and stenographic personnel. Its purposes are (1) to provide standards, which are in conformity with good usage, for the preparation of letters and memoranda, and (2) to ensure orderliness and uniformity in the performance of office routines.

F. The Foreman's Manual contains selected General SPIs of concern to all supervisory positions and a variety of information to guide the foreman in his relations with the worker.

Fig. 24. Description of One Company's System of Manuals (cont.)

STANDARD PRACTICE INSTRUCTIONS	Page	Classification Number
_____ Company, Inc. _____ New York	3 of 5	1.A.2

III. DIVISIONAL AND DEPARTMENTAL MANUALS.

As a group, these manuals contain principally two types of information: (1) operating procedure instructions to be followed in performing the work of the division or department (generally referred to as "departmental standard practice instructions"); and (2) technical standards, information, or instructions.

A. Procedure Instructions Manuals.

1. Purpose: The purpose of divisional and departmental standard practice instructions manuals is to promote uniformity, promptness, and orderliness in the performance of the routine, repetitive procedures of the department, including the handling of forms and other paper work, the posting and maintenance of records, and the preparation of periodic reports. The instructions contained in these publications serve as a medium for training supervisory and operating personnel and establish standards against which actual performance can be checked for compliance.

2. Scope: The scope of the instructions contained in departmental and divisional procedure manuals is limited to the work actually performed within the division or department. They should not contain instructions to personnel that does not come under the authority of the person by whose order the instructions are issued. However, since a departmental standard practice instruction often represents one serialized step in the execution of an interdepartmental, interdivisional, or Company-wide procedure, a brief description of activities performed by another department should be included, where necessary, to promote understanding and to ensure a smooth transition in the flow of work between departments.

3. Following is a list of existing divisional and departmental standard practice instruction manuals:

Accounting Manual. This contains a chart of accounts against which the capital and expense charges and credits of the entire Company must be applied. Other sections (i.e., general accounting section, cost accounting section, and timekeeping section) are departmental in scope.

Fig. 24. Description of One Company's System of Manuals (cont.)

STANDARD PRACTICE INSTRUCTIONS	Page	Classification Number
_____ Company, Inc. _____ New York	4 of 5	1.A.2

* Engineering SPI Manual.
Industrial Relations SPI Manual.
* Inspection SPI Manual.
* Methods Engineering SPI Manual.
Procurement SPI Manual.
Production Control SPI Manual.

* In addition to procedure instructions, these manuals also contain technical information and standards.

B. Technical Manuals. The Company's technical manuals contain such information as materials and manufacturing specifications, standard time data, standard contract clauses, maintenance and repair instructions, etc. In addition to the technical sections of the manuals listed in Section III-A-3 above, this group of manuals includes the following:

Contracts Summary Manual.
Field Service Manuals.
Material Standards Manual.
Standard Parts Manual.

IV. RESPONSIBILITY FOR DEVELOPMENT AND MAINTENANCE OF MANUALS.

A. The various positions responsible for the development and maintenance of the Company's general, divisional, and departmental manuals are designated by the Organization Manual. These positions are also listed in Supplement I to this SPI together with the name of the position by whose authority the instructions contained in the manuals are issued.

B. The responsibility for manual development and maintenance includes the following functions:

1. Planning the content and structure of the manual.

2. Determining the style of presentation of each individual standard practice instruction (i.e., whether the material is to be prepared in the form of flow charts or some other type of graphic presentation, in the form of written instructions, or in some combination of both forms).

3. Writing the instructions or drawing the flow charts and obtaining the final approvals required before publication.

Fig. 24. Description of One Company's System of Manuals (cont.)

STANDARD PRACTICE INSTRUCTIONS	Page	Classification Number
_____ Company, Inc. _____ New York	5 of 5	1.A.2

4. Preparing copy in the form required for reproduction.

5. Handling the details of publication and distribution.

6. Maintaining an approved distribution list.

7 Maintaining stock files of individual SPIs from which to fill requests for additional material or entire manuals.

V. AUTHORITY FOR ISSUANCE AND INTERPRETATION.

A. Although the responsibility for preparing and publishing formal instructions relating to the organization, policies, procedures, and standards of the Company is usually assigned to a staff position, such instructions are always issued "by order of" the principal—that is, by order of the position having line or functional authority over the positions to whom the instructions are directed. The principal may or may not sign or approve the instructions, but they have the same force as though actually approved by him. This procedure, however, is subject to the following limitations:

1. The person preparing and publishing the instructions must be guided by the expressed policies, plans, and decisions of the principal.

2. He must refer to the principal any contemplated departure from an established policy, no matter how minor.

3. When the principal has stated an objective to be attained or has outlined a plan for its attainment, all instructions for the attainment of the objective or for the carrying out of the plan may properly be issued "by order of" the principal.

B. Final responsibility for all instructions issued "by order of" remains with the principal.

C. Interpretations of General or Departmental Standard Practice Instructions can properly be made only by the principal.

Fig. 24. Description of One Company's System of Manuals (cont.)

Thus far we have considered only one element in the definition of scope—the area of application or the organization units to which the instructions in each manual apply. Once this matter has been settled, the remaining step is to decide what *subjects* the manual should cover. This may not seem necessary yet it forms an important part of the manuals program. It helps to keep manuals geared to the needs of the organization. It prevents the writing of instructions that serve no useful purpose and hastens the preparation of those that will. Some staffs have found it helpful to formalize the manual plan by drafting a *pro forma* table of contents listing all the subjects to be ultimately covered. This provides a check against orderly and continuous progress of the work; it permits the assignment of priorities to the most urgently needed instructions; and it helps preserve a systematic arrangement as the manual grows.

One point to bear in mind is that the plan should provide only for those instructions that will clearly achieve one or more of the objectives listed at the beginning of this chapter. It does not follow, for example, that because we have a departmental manual we must prepare written instructions on all activities of the department. Little would be gained by writing up an activity that is completely self-contained and performed by only one clerk. Similarly, much time and effort can be wasted in trying to write instructions on nonroutine functions requiring a great deal of judgment and administrative or professional skill. These might include the conduct of a supervisory training program, the forecasting of sales, and so on.

The second step in coordinating the contents of several manuals is to require that all departmental instructions be reviewed and approved by a central group to ensure that they are consistent and properly integrated with general instructions covering the same subject. The standard practice instructions partially reproduced in Figure 24 provide for this kind of control in the following words:

> VI. Coordination of general and departmental instructions. Whenever instructions to be included in a departmental procedures manual represent that department's share of an interdivisional or company-wide procedure, such instructions should not be released until they have first been cleared with the general procedures staff. This is necessary in order to coordinate the coverage and the time of issuance of all written instructions related to the same policy or procedure.

To tie the two sets of instructions together more tightly, the departmental release is usually cross-referenced to the general instructions in the following way:

General SPI 4.A.2, published simultaneously with these instructions, outlines the responsibilities of each department and the flow of work or relationships between departments in the processing of a factory order. This SPI, in turn, describes the detailed procedures to be followed by inspectors in carrying out the responsibilities assigned in the general SPI.

THE FORM OF INDIVIDUAL INSTRUCTIONS

Procedure instructions can be prepared in either narrative or graphic form or some combination of both. Visual presentation techniques should be used wherever possible, for they offer even greater advantages at this point than they did in the survey and presentation phases of the procedures study. In preparing a flow chart of the existing procedure, the analyst was trying to clarify a mass of details only in his own mind. In presenting his recommendations in graphic form, he was trying to persuade only a small group of executives and supervisors. But in drafting the final procedure instructions, he must communicate with a large group of operating people, many of whom do not have the understanding or interest that will enable them to grasp readily a complex procedure narrative.

Figure 25 contains a sample of one standard practice instruction presented in graphic form. It is of particular interest since it portrays, on one page, a procedure which, in narrative form, covered 14 pages. Thus the chief advantage of charted procedures is their simplicity and compactness. Explanatory text and repetitious cross references are minimized. The column headings fix responsibility for each step, the flow lines show interdepartmental relationships, and the operation numbers designate the sequence of steps.

Other types of visual presentation that may be used to advantage are graphs, sketches, diagrams, and facsimiles of forms. Where information on filling out or using a form must be included in the instructions, it should be tied in with the form itself rather than buried in the text. This can be done by entering the explanation either on the facsimile of the form (as shown in Figure 26) or in footnotes that are keyed by numbers to the various columns or lines of the form.

Not all instructions, of course, can be presented graphically. Some part of every manual will have to be prepared in narrative form. Here the job again is one of adapting the instructions to the "receiving apparatus" of the people who are to follow them. If this is to be accomplished, the material must be well organized, the sentences concise, and the words simple. Too often written instructions are not read because they are too long and forbidding or are not understood

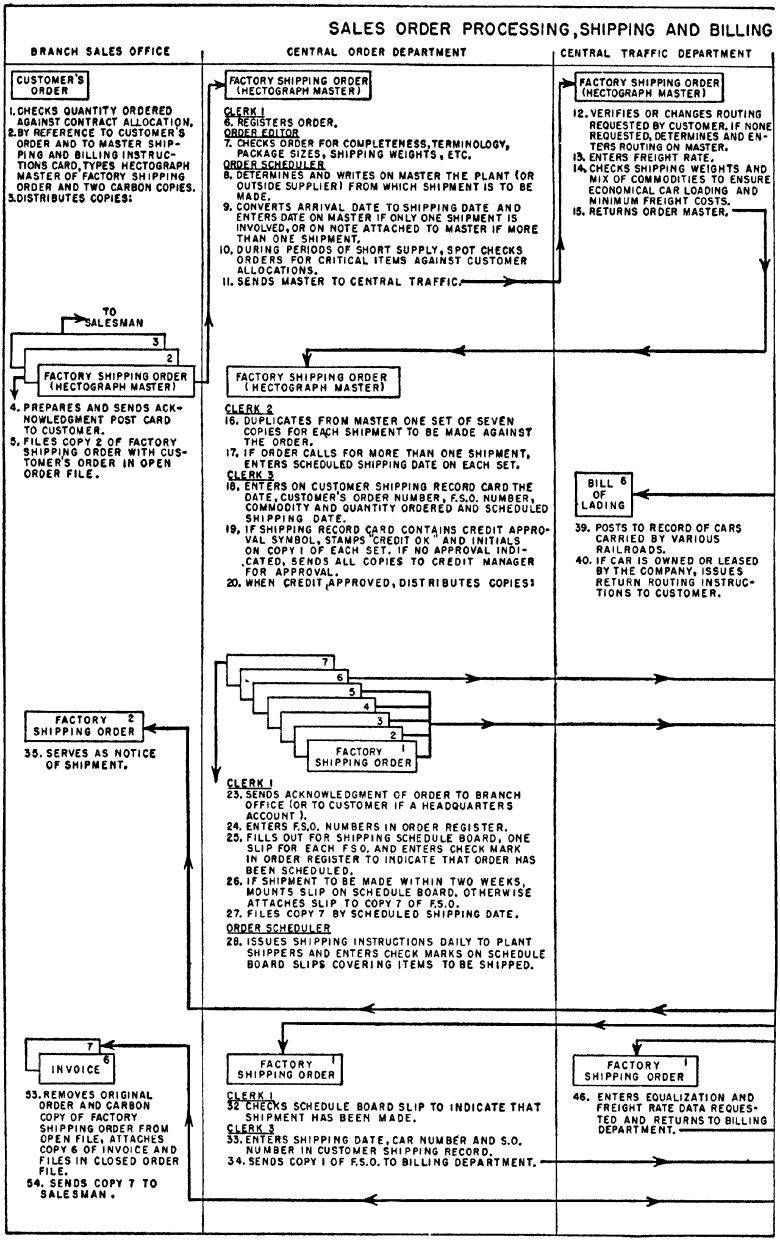
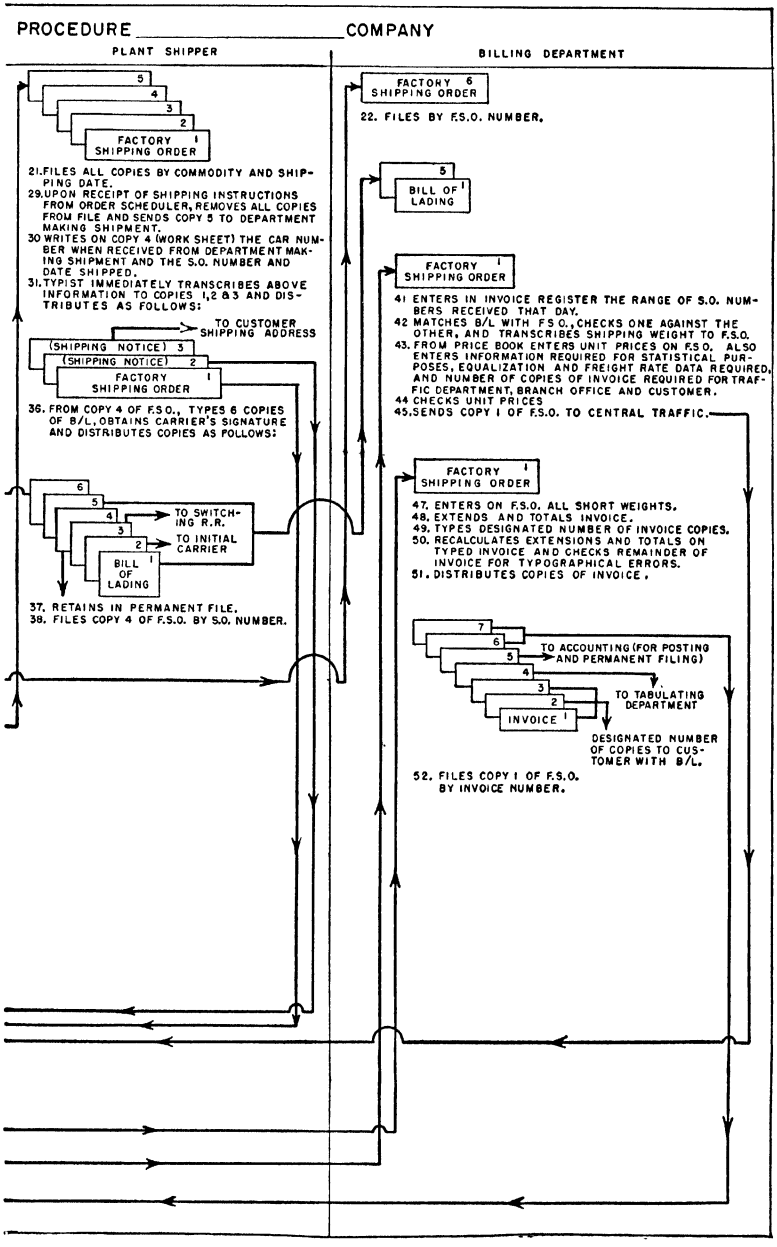
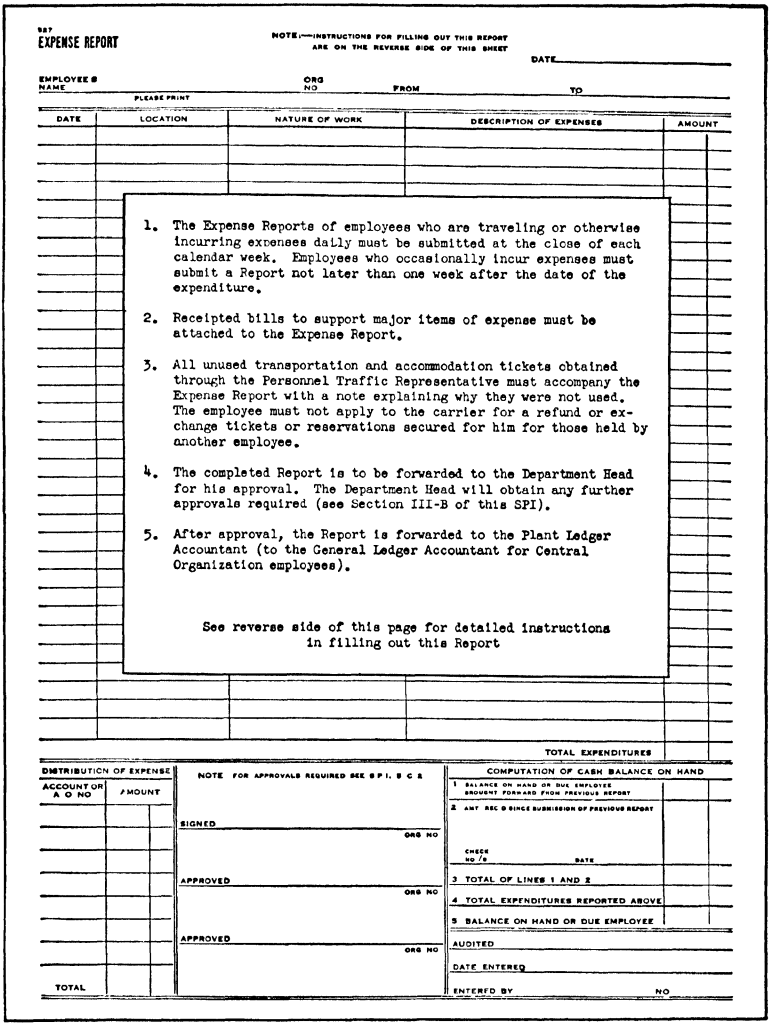


Fig. 25. Method of Presenting Procedure



Instructions in Graphic Form



987
EXPENSE REPORT

NOTE:—INSTRUCTIONS FOR FILLING OUT THIS REPORT ARE ON THE REVERSE SIDE OF THIS SHEET

DATE

EMPLOYEE # / NAME (PLEASE PRINT) ORG NO FROM TO

DATE	LOCATION	NATURE OF WORK	DESCRIPTION OF EXPENSES	AMOUNT

1. The Expense Reports of employees who are traveling or otherwise incurring expenses daily must be submitted at the close of each calendar week. Employees who occasionally incur expenses must submit a Report not later than one week after the date of the expenditure.

2. Receipted bills to support major items of expense must be attached to the Expense Report.

3. All unused transportation and accommodation tickets obtained through the Personnel Traffic Representative must accompany the Expense Report with a note explaining why they were not used. The employee must not apply to the carrier for a refund or exchange tickets or reservations secured for him for those held by another employee.

4. The completed Report is to be forwarded to the Department Head for his approval. The Department Head will obtain any further approvals required (see Section III-B of this SPI).

5. After approval, the Report is forwarded to the Plant Ledger Accountant (to the General Ledger Accountant for Central Organization employees).

See reverse side of this page for detailed instructions in filling out this Report

TOTAL EXPENDITURES

DISTRIBUTION OF EXPENSE

ACCOUNT OR A O NO	AMOUNT
TOTAL	

NOTE FOR APPROVALS REQUIRED SEE S P I. B C 2

SIGNED ORG NO

APPROVED ORG NO

APPROVED ORG NO

COMPUTATION OF CASH BALANCE ON HAND

1 BALANCE ON HAND OR DUE EMPLOYEE BROUGHT FORWARD FROM PREVIOUS REPORT

2 AMT REC'D SINCE SUBMISSION OF PREVIOUS REPORT

CHECK NO / & DATE

3 TOTAL OF LINES 1 AND 2

4 TOTAL EXPENDITURES REPORTED ABOVE

5 BALANCE ON HAND OR DUE EMPLOYEE

AUDITED

DATE ENTERED

ENTERED BY NO

Fig. 26. Facsimile of Printed Form Reproduced as Part of a Standard Practice Instruction and Containing Information on Use of the Form

because they are complex and poorly organized. This is probably a greater cause of procedure failures than any intrinsic weakness in procedures themselves. The analyst must come to understand that skillfully written instructions are an important means of implementation—a way of ensuring the fulfillment of procedure plans. He must approach this part of his job, therefore, not as one who is charged with writing rules and regulations that are to be studied until understood and followed without deviation, but as one who is trying to help and encourage the operator to do a better job. If his instructions are not written so that they can be understood *on the first reading,* he is inviting poor performance by the operator. If he writes in quasi-legal language and cumbersome sentence structure, he will cause only indifference, misinterpretation, or contempt.

If this seems overstated, the reader should decide with what certainty and enthusiasm he would carry out the following instructions which appear in the procedures manual of a metalworking company. This paragraph represents one of 27 similar paragraphs making up a six-page, single-spaced set of instructions.

> On movement of tools from plant to plant or plant to a subcontractor of the Company, the plant releasing the tool will be responsible for seeing that it is in proper condition before it is sent and for recording the release in an appropriate form. It shall first be delivered to that plant's Tool Inspection Section where a complete dimensional inspection will be made unless the record contains approval at a recent maintenance inspection and the tool has not been used enough to show perceptible wear. Then a visual inspection for damage, wear, and presence of all details will be made. In either case the inspection shall be recorded on the tool inspection record and on the tool maintenance inspection record, which two forms, as well as the print from the inspection office file, will be forwarded to the Company Plant inspection office receiving the tool if the transfer is to be to a Company Plant, but will be retained in their proper files if it is to be to a subcontractor, with each record marked as to the destination of the tool.

To avoid this kind of faulty communication, here are some of the things the analyst should do:

1. In planning or writing a set of instructions, think continuously about the person to whom you are writing. Who is he? How much does he know about the subject? How would you tell him about it in conversation?
2. Before beginning to write, study your notes thoroughly.

3. Then make a skeleton outline of main headings and subheadings. Organize the material according to the following pattern:

I.
  A.
    1.
    2.
      a.
      b.
  B.
II.

4. Study the outline to be sure that the instructions will be well organized—that they will flow in a logical sequence. Eliminate unnecessary points. Combine related ones under the same heading.

5. If the published material is likely to cover more than one or two pages, reproduce the major headings from your outline at the beginning of the instructions. This list of contents will help the operator locate easily a particular point within the instructions.

6. Use simple sentences and the simplest words that will make the thought clear. If you find that, in your effort to be precise or thorough, your sentences are becoming involved or your style tedious, try reading a few pages of any cookbook. The simplicity and directness of "Sift one cup of flour three times. Blend, do not beat, the ingredients," should help to straighten you out.

7. Break up the text by the use of headings corresponding to those listed at the beginning of the instructions. But don't use headings as a substitute for good organization.

8. When you have finished your first draft:

a. Challenge every sentence and word. Is it necessary? Does it mean exactly what you intend? *Could* it be misunderstood?

b. Check the over-all organization and the length of sentences.

c. Be sure that the instructions are complete and accurate. Are there any gaps that the operator will not be able to fill in? Is he told clearly from whom he will receive a document, what he should do to it, and to whom he should send it? Are form names and numbers and position titles correct?

d. Check the draft against other related instructions for adequacy and correctness of cross references, for consistency, and for unnecessary duplication of information.

Aside from simplicity and clarity in the treatment of the subject matter, it is also desirable to establish a standard format for each type of presentation used—that is, graphic and narrative. Such standards should cover (1) the use of flow lines, reference numbers, column headings, symbols, etc., on flow charts; (2) the numerical or alphabetical designation and the indentation of paragraphs in narrative material; and (3) the location of such information as the name, classification, and date of the instructions; the identification of superseded instructions; names of approvers; etc. As the manual holders become accustomed to a standard format, they are able to read each set of instructions more quickly and understand them more easily.

Finally, the operating personnel will assimilate revised instructions more readily if the ways in which new instructions differ from the old are clearly shown. One method of doing this is to place a single asterisk before any paragraph or line containing revisions of the former instructions and two asterisks before material containing additions. Another way is to summarize the changes in a letter of transmittal accompanying the instructions.

PHYSICAL CHARACTERISTICS OF THE MANUAL

Essentially, what we have been saying is that whether or not a procedures manual is *used* largely depends on how *useful* it is. Two factors that help to make the manual useful are ease of reference and ease of revision. These, in turn, are affected by the physical characteristics of the manual, such as the type of binder, the arrangement of instructions within the manual, the provision of indexes, etc.

In companies that have no formal procedures manual, every supervisor accumulates in his files or desk drawers a miscellaneous collection of memorandums, bulletins, or written instructions governing repetitive situations. Anyone familiar with this practice knows how seldom such material is referred to. Thus, an important step in encouraging the use of procedure instructions is to give every recipient a binder in which to file them. In this way the instructions will not be misplaced or disarranged, and the supervisor is more likely to keep them within reach on top of his desk. The binder, of course, should be of the loose-leaf type so that revisions and additions can be made easily.

Within the binder, instructions can be arranged either in the se-

quence of publication or in groups covering related subjects. The former is more convenient for persons preparing the material since they neither have to plan the structure of the manual in advance nor experience difficulty in classifying individual instructions. From the viewpoint of the user, however, a subject arrangement is better for several reasons: (1) The manual seems more coherent to him if its contents are logically arranged. (2) He soon becomes accustomed to the major groupings of material and, therefore, refers to the manual more easily. (3) Under a subject arrangement, instructions that are cross-referenced are usually located close or next to each other.

Where a subject arrangement is used, some type of numerical or alphabetic classification is needed to identify individual instructions and to designate their location in the manual. A common practice is to use a series of digits separated by decimal points—the first digit representing a major section of the manual; the second, a subsection; and the third, the individual instructions. For example, a standard practice instruction entitled "Return of Rejected Material to Vendors" might be classified 4.2.6. Here the digit 4 might designate a major section entitled "Acquisition and Control of Materials"; the digit 2, a subsection entitled "Receiving and Inspection"; and the digit 6, the place of that instruction within the subsection.

Whatever method of identification is employed, the important consideration is to make it flexible enough to preserve an orderly, logical grouping of material as the manual grows.

Two other features of a well-designed manual are tab dividers and indexes. Both facilitate reference and therefore increase the use of the manual.

An easy way of developing a subject index is to write each single index entry on a separate, small file card. When the entire manual has been indexed, the cards can be alphabetized, and subjects falling under a common heading can be consolidated on one card. After the index has been published, this set of cards should be kept up to date as new instructions are added to the manual. In this way a revised index can be published as often as necessary without further research.

In preparing the index, be sure to include the title of each position and name of each department appearing in the manual. This will highlight for each supervisor all the instructions specifically applicable to his position. In addition, when the standard practice instructions refer to printed forms by number instead of by name, prepare and publish a separate numerical index of forms.

MANUAL DISTRIBUTION

The next requirement of an effective manuals program is that written instructions must be distributed widely enough to reach all the persons who are to follow them. This does not necessarily mean that a copy of the manual should be given to every clerk. It does mean, however, that every supervisor should receive the instructions affecting his operations and that his manual should be constantly available to his subordinates for reference.

Policies on distribution of manual material vary widely from company to company. Some treat their manuals almost as confidential information and limit the distribution accordingly. Others follow a policy of sending everything to everybody. Both policies have obvious weaknesses. The first does not provide for sufficient communication to keep each organization unit continuously informed of its responsibilities. The second causes supervisors to waste much time reading instructions that do not relate to their jobs.

The ideal arrangement, therefore, is to issue a manual binder to each supervisor, but to follow a policy of selective distribution on individual standard practice instructions. One company follows this practice by assigning a distribution group number to manual holders in each major organization unit. This grouping is as follows:

Distribution group number	*Organization unit*
1	General management
	Elected officers
	Division heads
	Works managers
2	Sales
3	Engineering
4	Treasury and accounting
5	Production departments and industrial engineering
6	Production control, storeskeeping, receiving, and shipping
7	Inspection
8	Purchasing
9	Personnel relations

These distribution groups are published in the introduction to the manual, and the numbers assigned to the groups receiving each standard practice instruction appear on the first sheet of the instruction. In

this way, each recipient knows which other groups have received the material, and the procedures staff does not need to keep separate distribution lists on each instruction to know who should receive additions or supplements.

ENFORCING PROCEDURE INSTRUCTIONS AND KEEPING THEM UP TO DATE

Most of the steps already discussed in this and the two previous chapters are aimed at encouraging the operating personnel to follow new procedures spontaneously once they have been adopted. In summary, these steps are:

1. "Selling" the proposed plan to the executives and supervisors affected by it.
2. Thoroughly training the operators before and during the installation.
3. Making periodic audits of the procedure in operation.
4. Preparing procedure instructions that are simple and easy to understand.
5. Publishing them in a manual that is easy to use.
6. Distributing the manual widely enough to reach everyone who must carry out the instructions.

The final and probably most important prerequisite of spontaneous adherence is that the manual must be kept up to date. This is more than a job of periodic revision, for a manual cannot be a "little bit" obsolete any more than a person can be a "little bit" dead. If only 10 per cent of the instructions are out of date, the entire manual loses its value as a reference device, for the operator cannot be expected to know which is the obsolete 10 per cent. Conarroe emphasizes this point in the article already quoted: [1]

> . . . The importance of this [a systematic program of revision] is sometimes overlooked with the result that the manual soon becomes discredited and unused. Inaccurate information is often much worse than none at all. After one or two bad steers from this cause, the employee is pretty quick to lose confidence in it as a source of information, and it soon takes its place as an office ornament rather than an implement.

Part of the problem of protecting against manual obsolescence is related to the sense of corporate discipline—or lack of it—that pre-

[1] E. H. Conarroe, *op. cit.*, p. 1202.

vails throughout the organization. If a tradition of casualness or indifference to formal written instructions has been permitted to develop, even the most thorough program of manual maintenance will fail to keep pace with the latest practice. Thus these two matters of obsolescence and enforcement are treated together, since they are really sides of the same coin. Procedure instructions obviously should not be enforced if they are obsolete, but one reason they become obsolete is that operators willfully ignore them or take it upon themselves to modify them.

For this reason one of the key elements in any program of enforcement is the attitude of top executives toward violation of written instructions. It is both unwise and wasteful for management to authorize publication of such instructions without clearly making known the fact that it expects them to be followed until they have been modified in the prescribed way. Unless this is done, the operating personnel will be encouraged to make its own revisions of formal instructions as expediency dictates and in so doing, to assume authority that management does not intend it to exercise.

The following excerpt from the introduction to one company's standard practice instructions manual emphasizes this point:

II. Adherence to standard practice instructions

A. Standard practice instructions are developed from recommendations made by the supervisory personnel of the company and by the members of the management controls staff. The contents of the SPI manual, therefore, reflect the knowledge, experience, and decisions of the company's executives and its supervisors and the constant investigation and analysis carried on by the management controls staff. The policies and procedures comprising the manual are considered essential to the best over-all operation of the company's business. It is recognized that day-to-day operating experience often reveals the need for changing a given policy or suggests better ways of carrying it out. However, when operating personnel take it upon themselves to make such changes simply by not adhering to the written policies or procedures, then confusion and delays result.

B. For these reasons, supervisors are responsible for following standard practice instructions as they are published and must see that the employees they supervise adhere to the published instructions. If a supervisor questions the necessity of a given policy or procedure, or if his operating experience suggests the need for change, he then has two responsibilities: (1) following the published in-

struction until it is changed and (2) arranging to have it revised promptly by taking the steps described in Section III-A below.

Much the same thought is expressed more simply in the manual of another company:

There is nothing sacred about the procedures and policies outlined in this manual. Should you take exception to any of them and have constructive criticism to offer, it will be welcome. However, unless and until a policy or procedure is changed, it must be observed by all concerned. Otherwise confusion, misunderstandings, and inefficiency are inevitable.

A second important step is to discourage "wildcat" changes by clearly defining the channels through which written instructions should be issued or revised. This is necessary to stop the flow of conflicting oral instructions and letters, bulletins, or other informal written instructions—all of which tend to break down the authority and accuracy of procedure manuals. Any such restrictions, however, should not appear to place a moratorium on change or to discourage constructive suggestions for improvement. Rather, they should be thought of simply as a means of keeping manuals up to date and of making sure that the needs of all departments are considered before changes are made.

The big risk, of course, in funneling all proposed procedure instructions through a single point is that the adoption of worthwhile changes will be unnecessarily delayed. To avoid this danger, the path of revision must be short, easy to follow, and well understood by everyone. The approvals required must be clearly specified and held to a minimum, and the procedures staff must be geared to process recommended changes quickly. Unless this is done, operating personnel will soon become discouraged from submitting recommendations through the prescribed channels and will revert to making its own changes as the need arises.

One factor affecting the speed of handling revisions is the form in which they are published. This may be either (1) a supplement to the existing instructions, (2) revised pages to take the place of superseded ones, or (3) a completely new set of instructions. The first two methods are obviously faster and less expensive than the third and, therefore, are recommended for making minor modifications or for announcing important changes without waiting for all the details to be settled and published formally as a revised standard practice instruction.

One company clearly identifies all revisions of or additions to existing instructions by publishing them on a special colored paper. These "SPI bulletins," as they are called, bear the same classification as the instructions they modify. In addition, each bulletin begins and ends with statements similar to those that follow:

Section II-C of SPI 6.A.4, dated 7/6/49, is modified to read:

Please file this bulletin in your manual immediately following SPI 6.A.4 and enter a cross reference to the bulletin on page 3 of the SPI next to the section modified.

Another part of the control plan should be to integrate manual revisions or additions with the ordering of printed forms. We have seen throughout this book that most procedures are concerned with filling out, distributing, posting from, and filing business forms. Thus, by centering in one position the responsibility for ordering all forms, it becomes possible to hold up many procedure changes until the covering instructions have been prepared and approved.

The final method of ensuring adherence to written instructions is to include a policing point within the procedure itself. That is, at some point in the procedure, provision can often be made to reject a request for action or to suspend action if existing policy or procedure instructions are not being followed. For example, a procedure on transferring personnel might require that all transfer forms initiated throughout the organization be routed to the personnel records unit for auditing before the transfer may take place. This method of continuous control not only helps to keep performance in line with the prescribed practice but also reduces the amount of follow-up work that the procedures staff must do.

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