How to Keep Product Costs in Line

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Preface

This book describes practical ways to reduce operating costs in a manufacturing organization. It offers a rational approach to the analysis of cost and introduces several techniques intended to enable the reader to identify high cost elements of a product.

Each chapter deals with one specific, independent subject which in some ways is related to a cost improvement program. These chapters are not intended to compete with the many excellent volumes available on cost accounting, economics, or project management but are designed to serve as focused references on those subjects.

The purpose of this book is to provide a pragmatic guide with sufficient information for the initiation and administration of a viable, results-producing cost improvement program on a corporate, divisional, or departmental level.

This book does not offer any miracle cures for the elimination of excessive costs. The techniques discussed in it were born from economic necessity and should be viewed as supplements to, not as substitutes for, sound management practices. They are a practitioner's view on a possible course of action when a business faces only two alternatives: reduction of cost or shutdown.

Chapters 1, 5, and 9 through 11 mostly deal with the human aspects of a cost improvement program. Chapter 1 suggests the positioning of such a program in the corporate organization. Chapter 5 dwells on employee suggestion systems, their merits and limitations. Chapters 8, 9, and 10 deal with the management and control of such a cost improvement program.

Eventually any cost improvement must be translated into an implementation of change. Chapter 10 puts the complexity of change implementation into a proper perspective, and it describes how change might affect the different functions it touches. Chapter 11 has been totally devoted to the extremely important elements of human relations.

Chapters 2, 3, 4, 6, and 7 are devoted to the technical end of a cost improvement program. Chapter 2 describes the elements of cost which enter into the making of a product. Chapters 3 and 4 guide the reader through several methods of identification of cost offenders. Chapter 7 deals with a relatively new approach to the detection of out-of-line cost through the use of experience curves.

We certainly hope that this book will become a standard, useful reference on every manager's bookshelf.

Nathan Gutman

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1

The Industrial Organization

INTRODUCTION

In order to exist, any business, regardless of size, must perform certain essential functions. The owner of a small shop could successfully perform all the basic functions alone or with part-time help from some selected professionals. Large corporations, on the other hand, may require hundreds or even thousands of employees to support all of the needed functions.

While the small businessperson may easily decide what needs to be done where, a large corporation needs a **structure** to bring all the different elements of the business into the position of greatest effectiveness; it needs organization. The business organization is a means of coordinating the movements of the different elements, the human energy, physical assets, time, and money to ultimately achieve the production of goods and services. It consists of groupings of activities to facilitate flow of information, accomplishment of work, and control. The groupings vary from business to business and organization to organization, but they always include these basic functions.

The purpose of this chapter is twofold. First, it is intended to refresh one's knowledge of the different functions at work in an industrial organization. This discussion will benefit those working on cost reduction projects, who needlessly spend many frustrating hours in search of information on cost, product, process, or materials.

Second, it is intended to serve those managers who might consider introducing into the organization a new function aimed specifically at cost improvement. Not since the Great Depression have solutions been so desperately needed for the problems of constantly escalating costs and falling productivity. Today, special attention to such problems, through the creation of specific functions, can be justified more than ever.

Traditionally, there are four major groupings of functions in an industrial organization:

1. Marketing and sales
2. Manufacturing and quality control
3. Engineering and research
4. Finance and administration

Our discussion will include the additional function of cost improvement (Fig. 1).

MARKETING AND SALES

The marketing and sales functions (Fig. 2) appear in business organizations in different forms. They may fall under an umbrella function called either marketing or sales, or they can be treated as two separate departments. Within the context of this book we will take the umbrella approach and will refer to it as marketing. We will define its mission as directing the flow of goods and services from the producer to the user.

In simple terms, the marketing function reveals what it is that the consumer or user universe wants. It lets consumers know that its organization has a product or products that satisfy these wants, and that it is eager to exchange them for a proper amount of money. The sales function consummates the transaction. It notifies manufacturing what to ship where and provides the necessary customer service to resolve any problems the customer might have with the product.

Marketing can be organized in different ways. It can be organized by product lines in which unique families of products are handled by specific departments. It can be organized geographically so that a given department is charged with marketing in a specific geographic area, or it can be organized by major

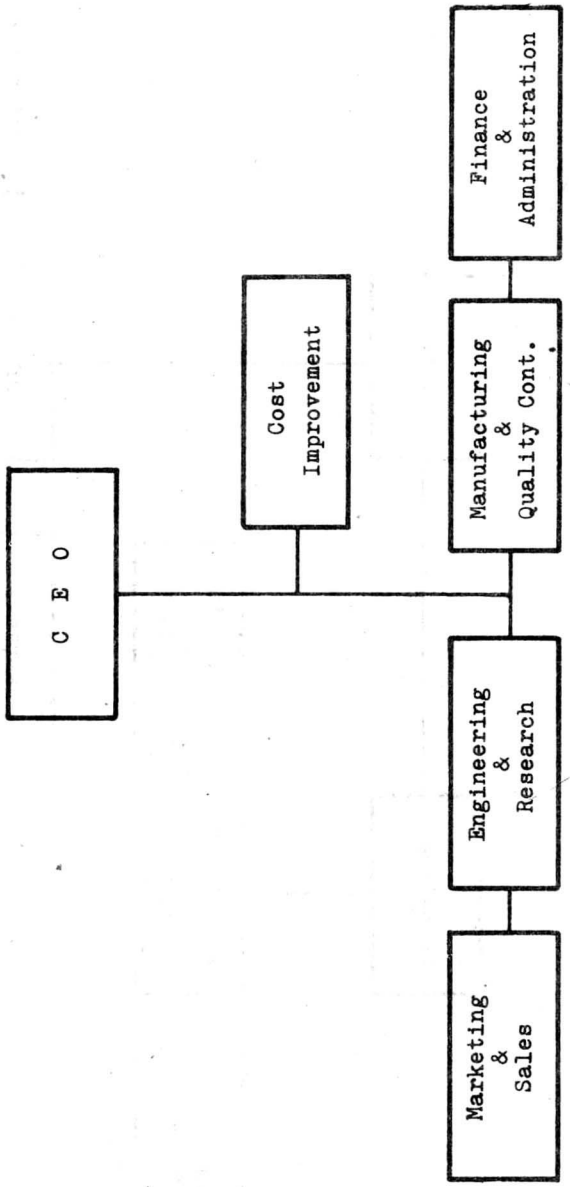

Fig. 1 The basic industrial organization with a cost improvement function.

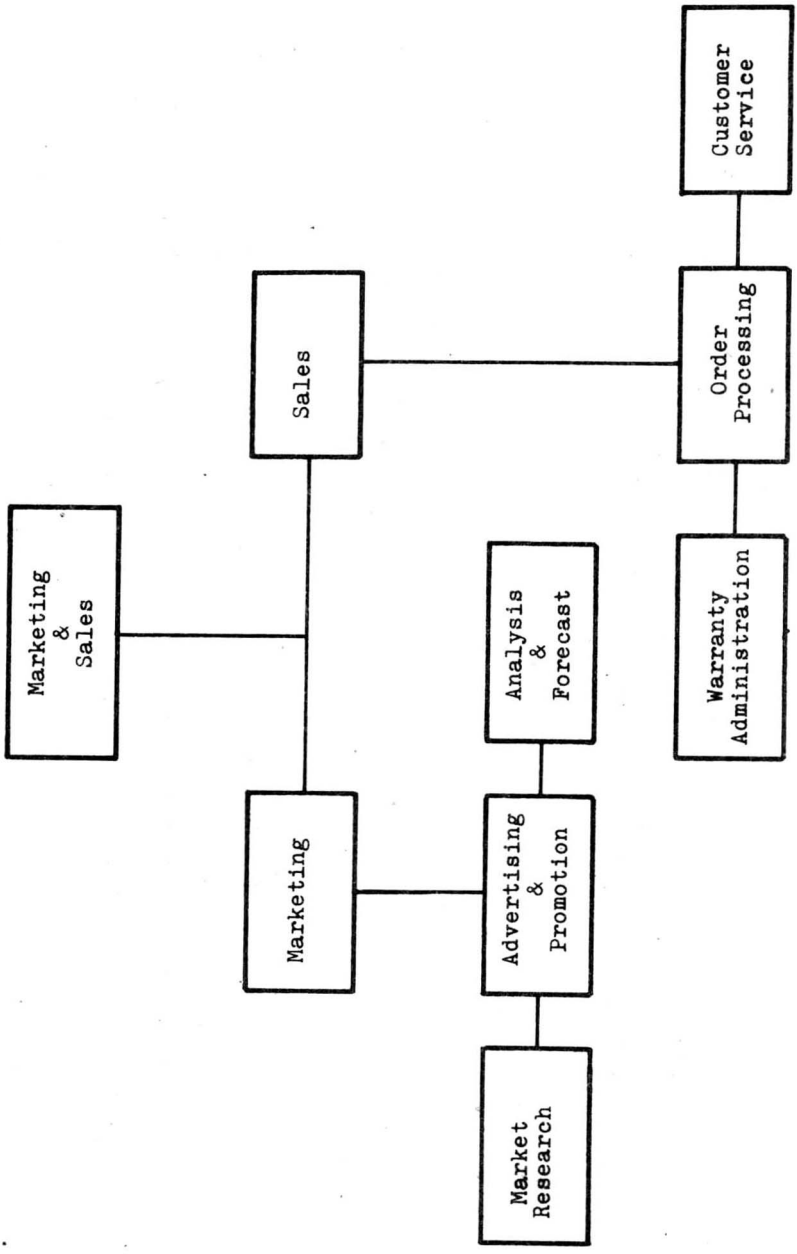

Fig. 2 The basic marketing and sales organization.

customer accounts. The different groupings of responsibilities within marketing do not in any way change its basic mission.

Marketing needs to know for which of its products there is an existing demand and for what kinds of new products there could be a demand. This work is done by the *market research* subfunction. Market research input is vital to the cost reduction program. For example, in order to reduce cost, an idea might be considered to eliminate some of the features from a given product. The question is: Will the modified product still satisfy the demand—will it continue selling? Market research can reexamine the product's intended and actual uses, identify the features or specifications for which the demand no longer exists, and verify those which are absolutely essential to the marketability of the given product.

Another part of marketing's mission is to communicate to potential buyers what products or services the business has to offer and at what price. Advertising and promotional activities are thus required. Through such efforts the cost-effective new products can sometimes generate a bigger demand than existed for the old established ones.

Still another marketing activity is required to forecast and plan the number of units of a product to be sold. Sales forecasts are important to those involved in the cost reduction program. As in any other project, the economic feasibility of cost reduction projects must be determined. That feasibility depends, among other things on the number of units to be sold. Schedules of some cost reduction projects can extend to months or even years. The economic feasibility of cost-reducing changes will always depend on sustained demand for the product.

Customer service is another subfunction of marketing that can provide valuable assistance to the cost reduction project teams. First, it can shed light on warranty cost and product defects. Very often these cost are not high enough by themselves to trigger action, but within the scope of a cost reduction project they might be addressed. Product improvement changes could be introduced along with other cost-reducing changes to also reduce warranty cost.

Second, customer services, through its network of field service representatives, can conduct field testing of pilot production. In many instances, in which cost-reducing product changes are extensive, or where laboratory testing cannot determine the reliability of a new design, field testing under actual user conditions is absolutely mandatory. In many organizations this could be handled very effectively by the customer service group.

Finally, less relevant to the cost reduction program, but required nevertheless, the marketing department also processes orders, handles requests for product literature, maintains a distribution network, and schedules delivery dates.

MANUFACTURING AND QUALITY CONTROL

Unlike marketing and sales, manufacturing and the quality control functions (Fig. 3) are more often than not separated into two independent departments. For the purposes of discussion, we will assume here that the quality control function is included in the manufacturing department.

The manufacturing department is charged with the procurement of necessary materials, with processing these materials into finished goods, and with shipping these goods to the user. The quality control function is set up to ensure that all materials entering the plant and all finished goods leaving it conform to predetermined specifications.

Very often the materialization of a cost reduction change appears to be "stonewalled" by the manufacturing system, but in all probability, it is not. This apparent stonewalling is instead caused by underestimating the complexity of the manufacturing system. Better understanding of that complexity will enhance one's appreciation of the amount of work required to successfully implement a cost-reducing change and help to formulate realistic implementation plans.

The manufacturing function consists of a whole array of subfunctions that can be grouped in different ways, depending on factors like volume of production, diversity of operations, single or multiplant operations, proximity of the plants, and so on.

The following list of subfunctions represents most of the work needed to be performed in the manufacturing organization in order to process materials into saleable goods:

- *Materials management*
  - Production planning
  - Change coordination
  - Receiving and shipping
  - Production control
    - Routing

Scheduling

Material and supplies procurement

Inventory control

- *Manufacturing engineering*

  Industrial engineering

    Time standards

    Methods

  Production engineering

    Make or buy analysis

    Sequence of operations

    Selection of equipment

- *Plant engineering*

  Plant and office layout

  Environmental control

  Grounds and building maintenance

  Equipment setup

- *Machine design*

  Tool, fixture, and equipment design

  Tool room

- *Quality control*

  Receiving inspection

  Work in process inspection

  Finished goods inspection

  Tool and gage control

FACTORY OPERATIONS

The *materials management* function regulates the movement of raw materials, supplies, and finished goods through the plant. Materials management is usually further broken down into the following subfunctions:

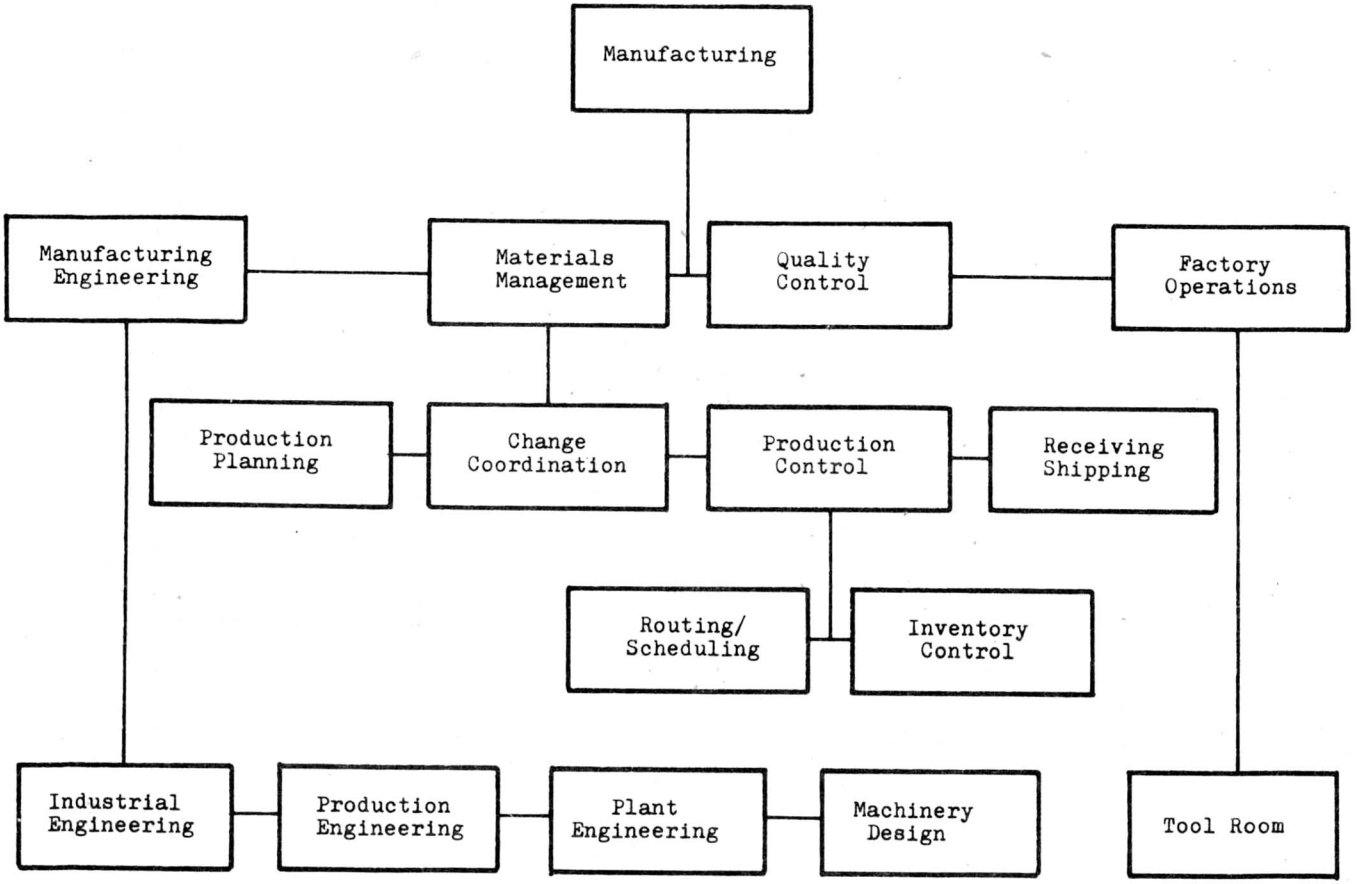

Fig. 3 The basic manufacturing organization.

Production control

Change coordination

Receiving and shipping

Materials and supplies procurement

Inventory control

All of these subfunctions are extremely important to the introduction of cost-reducing changes. The proper coordination of the different activities is vital to the successful implementation of cost reductions. For that purpose, some organizations include, as shown here, a special change-coordinating function designed to expedite all activities needed to successfully introduce a change.

Production control notifies the proper departments as to what equipment will be needed to make a given part. It plans the sequence of operations and determines economic lot quantities. Production control checks inventories and triggers the procurement of materials and supplies. It plans the dates when finished parts will arrive to the stockroom or warehouse and be available for shipping.

Receiving and shipping, as the terms imply, are the two points within the system through which all goods pass, both when entering the factory and when leaving it.

The materials and supplies procurement function is the company's contact with the outside world. Unlike the marketing and sales function, which maintains contacts with customers who receive finished goods, the procurement function maintains a line-up of vendors who supply the materials and services needed to produce the goods. The procurement function, often called purchasing, plays an important role in selecting vendors and subcontractors, and in negotiating prices and leadtimes. Leadtimes are important in planning the dates for physical implementation of the cost-reducing changes. Purchasing notifies production control of the leadtimes, and production control in turn uses them to plan production schedules.

The inventory control subgroup is asked to know how much or how many of a product or material is on hand and where it is stored. High inventories can adversely affect the implementation of cost-reducing changes. Another problem is the case of unbalanced inventories. For example, to make one *A* assembly, one part *B* and one part *C* are needed. Inventory shows that 1000 *B*s are on hand, but only 500 *C*s are available. An order must be placed for more