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The use of direct costing for planning and control in a wood preserving company a case study

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THE USE OF DIRECT COSTING FOR PLANNING AND CONTROL IN A WOOD PRESERVING COMPANY
A CASE STUDY

A THESIS
SUBMITTED TO THE FACULTY OF ATLANTA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

BY
BELAY WEGAYEHU

SCHOOL OF BUSINESS ADMINISTRATION

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CHAPTER I

INTRODUCTION

The dynamics of this modern complex economic system are evidenced in markets, materials, labor requirements, production methods and distribution. To successfully cope with these vast and constant changes, firms must have at the helm managements that are flexible, attuned to change, ready to seize advantageously every opportunity, ever watchful and ready to gain and hold consumer confidence by offering a superior product, in design and quality, coupled with prompt and efficient service. The emphasis in management, then, must be laid upon flexibility, efficiency and economy. For through flexibility markets can be captured, through efficiency promised deliveries maintained, and through economy a high standard of quality product offered profitably. Hence, readily available to management must be reliable information for prompt establishment of target price, information concerning the efficiency of the operation and information relative to costs and variances from the standard.

Reliable information must be ever present so that
decisions can be made instantly based on sound facts and geared to the immediate needs of the business organization concerned. These prime requirements may seem the essence of simplicity but situations make them usually difficult to obtain and at times too late when they are available.

To meet these problems, management has been seeking new ways to improve the information flow on which to guide executive actions. As a result, new methods for data analysis and measurement have been developed in the field of accounting. These new methods are flexible budgets, direct costing, break-even point, and variance analysis.

Some of these methods have been in use for many years but they are "new" in the sense that they have not been widely accepted and applied by any sizeable number of industries.

The Direct Costing Method which is sometimes called "variable" costing seems to be the most controversial of all the above-mentioned techniques. The origin of the term "direct costing" has been ascribed to Jonathan Harris, who used it for the first time in his article "What Did We

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In order to fully appreciate this method of costing it is first of all necessary to define the term "direct costing."

Definition.--The shortest and easiest definition of direct costing states that it is the classification of manufacturing costs between those which are fixed and those which vary directly with volume of production. Fixed costs are those costs to which management has committed itself and are not expected to change as a result of short-run fluctuations in production volume. These are costs which are expected to change, not by productive activity, but only by management decisions. Some costs may be classified in the category of fixed costs for a budget period because they are not controllable within that period. In direct costing fixed costs are treated as period costs and are charged to the income of the period in which such costs occur. On the other hand, variable costs are those costs which are a "consequence of the production of the product,"1 and are,


therefore, assigned to the product. These costs are expected to increase or decrease in direct proportion to volume of production. A variable cost in direct costing is capable of being identified with a product or production activity to the extent that the cost will be incurred for each additional unit of product produced and saved if the additional unit is not produced.

Under direct costing system, only direct material, direct labor, and variable manufacturing overhead costs are considered in the determination of cost of sales and inventory values.

Status of direct costing.--Although direct costing has been advocated by its ardent supporters for the last nearly thirty years, it has also been attacked by equally strong critics. Despite the fact that it is still a hot issue in business and academic circles, it seems this method has attained the status of an accepted technique of internal reporting to management. In the area of external reporting, the disagreement over the use of direct costing is still continuing and the end does not seem to be in

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sight. The opponents of direct costing argue that it is a backward step in the evolution of accounting theory and practice, and that it will destroy the traditional accounting presentation of income statement.

The American Institute of Certified Public Accountants has not recognized direct costing and the Institute's opposition to the use of this method in external financial reports continues in full force and effect. This fact is unveiled by the following statement:

...Nothing in the accounting research bulletins issued by the Committee on Accounting Procedure can or should be used to support the use of direct costing in published financial statements.\(^1\)

In addition, neither the Institute's Division of Research nor its Accounting Principles Board contemplates issuing any study or official statement in the near future regarding the merits or demerits of direct costing for external reporting.\(^2\)

Generally, the position of the tax authorities is not different from that of the American Institute of


\(^2\)Letter from Paul Gardner, Assistant Manager of Technical Information, American Institute of Certified Public Accountants, January 10, 1967.
Accountants. However, the element of consistent practice appears to dominate all other considerations in meeting the requirements of the Internal Revenue Service rules. This consistency doctrine has been wisely selected as that of major importance and in at least certain instances seems to have given an opportunity for the direct costing method to be successfully employed and defended.

The supporters of direct costing, on the other hand, show a great deal of enthusiasm when they present the case for direct costing. They argue that "Direct costing is the only method which clearly reflects periodic income, then it is really the one and only correct cost method to be employed." In addition, they insist that as long as direct costing meets the needs it is intended to serve regardless of whether it conforms to the generally accepted practices or not, should be accepted as good accounting method.

Statement of the problem.--When stated in simple

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1 Wright, op. cit., p. 215.
2 Ibid.
terms, the main criticism against direct costing is that inventory values are understated in comparison to full absorption costing. The advantage is generally considered to be, that with only direct costs moving through inventory to cost of sales, the distortion caused by varying levels of production and sales is eliminated. Another benefit derived from direct costing is that it provides the basic data necessary for the analysis of the complex interrelationship of volume, price, and cost in the determination of profit. The most practical test of a new method is how it works in practice.

The management of the company in this case study has used direct costing in planning, controlling, and reporting activities in the company for the last nearly nine years. Therefore, in this study the author attempts to find out what has been the experience of the management of this firm with this method.

This study attempts to explore the reason for the management’s decision to convert its costing method to direct costing and the method employed in implementing the conversion. The study also attempts to determine to what extent the adoption of direct costing has facilitated the flow of information and thereby enabled management to
achieve its objectives, namely, the purpose for which direct costing was adopted.

**Significance of the study.**—The importance of the study of direct costing can be seen from the fact that it is very rarely possible to read any accounting literature today without coming across the pros and cons of direct costing. This case study is of particular significance because one of the members of the management of the firm under study publicly advocates direct costing. In addition, since the company has experimented with the method, studying the experience of the firm enables the writer and all interested in the subject to determine if the advantages claimed for direct costing are real and can pass the test of actual usage.

**Delimitation.**—This is a study of one particular firm and the manner in which it uses direct costing. This does not mean that all firms using this method of costing use it the same way.

**Design of the study.**—In writing this paper the author has drawn on the information in direct costing system now in use at the company which he has been privileged to visit, observe, and interview the assistant controller. Telephone interviews have also been used to obtain
supplementary information.

Materials used for teaching the supervisors and foremen on how direct costing works in the company have also been used. Since the author had limited access to the books and other documents of the company, all of the information is obtained from the assistant controller.

Books, journals, and periodicals in the field have been used in order to acquaint the writer with the status of direct costing among different authorities.

The descriptive form is used in writing this paper. Exhibits are inserted only where they are found to illustrate the situation better than descriptive data.
CHAPTER II

ADOPTION AND APPLICATION OF DIRECT COSTING BY A WOOD PRESERVING COMPANY

The company particularized in this case study is one of the twenty major companies in the wood preserving industry. It is a private company with an annual sales volume of over twenty million dollars and approximately one thousand employees on its payroll.

The company was founded in 1908 and produces and sells twelve different types of products of varying sizes. Some of its products are crossties, switchties, lumber, poles, posts, floor blocks, crossarms, and other creasoting and creo-pine products. It also renders treating services to customers who bring their own crossties, switchties, lumber, and poles.

The absorption method of costing was used in this firm until 1959. The problem which management had with absorption costing was that despite a brilliant production record maintained in the firm, final profit continued to be
inconsistent with the weekly and monthly results reported. Even with detailed explanations and reconciliations attached to periodic income statements, top management could not fully understand why profit should be high when sales are low and vice versa. An individual working in the controller's office of the company explained the problem of management by saying "people in top management are intelligent, sincere, hardworking, and often harried men, but they are not trained to study or analyze detailed accounting statements." Therefore, in order to enable management to understand financial statements, such statements must be clear-cut, free of details, brilliant, and simple. He is convinced that direct costing does that and also eliminates all additional explanations and reconciliations necessary under the absorption method.

The other major difficulty was inventory valuation. It has been rarely possible for the company to have a straight run production in the plant. Under normal conditions of an instant market and less continuous production, it is inevitable that some errors are likely to be made in computing requirements for production. When actual sales are higher or lower than planned, due to change in the market demand, certain items must be dropped and others
emphasized in production. Such decisions cause inventory stockpiling at certain points not generally experienced in straight run production. In such a situation, under absorption costing, inventory valuation becomes difficult and complex, and also inaccurate. The reason is that management tends to be reluctant to include all relevant charges in the inventory values. Consequently, until the product reached the finished stage, only material and labor costs are charged to product cost. Then manufacturing overhead is added at the finished stage. The difficulty in controlling the operation and reporting the efficiency of each department under these conditions became apparent.

Thus, because of production time element, changes in market demand, production is rarely matched with sales. The problem of inventory valuation at any stage and control through cost administration became difficult if not impossible. Therefore, management decided to adopt direct costing which in one of the official’s words "is a practical technique to be applied to things as they are, to show the position as it is, ...not as it should be or might be."

In addition, the major raw material of the firm is wood. The cost of wood is affected by several factors and no one employee can reasonably be held responsible for the
control of all factors. For instance, the cost of wood is affected by quantity, price, handling, species, diameter, location of woodlands, straightness of the wood, the way the limbs are cut, etc. The accounting for the cost of wood where so many variables are present clearly indicates the need for separate control on each of the functions involved in the procurement, handling, and usage of wood. The only costing method which can produce significant control with a minimum of recording and reporting is believed to be direct costing method.

Implementation of the conversion to direct costing.

-- It was in 1959 that management introduced the direct costing method and flexible budgeting into its operation. The idea of the change in the method of costing was initiated by the assistant controller who is an advocate of direct costing. At the initial stage, his effort to change the method of costing in the company was met with resistance from top management, superintendent of the plant, supervisors, and foremen. However, by teaching and showing how direct costing works to the supervisors and foremen, he convinced them that the method, if adopted, is to their advantage. He then succeeded in convincing first the superintendent and then top management on the basis of the argument
that the supervisors and foremen have accepted it.

After the human aspect of the change was completed, management turned to the technical aspect. By means of analysis of the data relating to prior periods, a segregation was made of the variable (direct) and fixed costs (overhead). By using past experience and judgment, management divided the operation costs of the company into two major divisions.

Classification of costs.--The two major divisions under which the operation costs of the company are classified are direct costs and overhead costs.

Direct Costs

The costs which are included in the direct cost category are the following:

- Wood cost at origin
- Freight-in on wood
- Oil cost
- Freight-in on oil
- Plant hourly paid labor and supplies
- Repairs and maintenance of certain equipment
- Power and fuel in some centers

Overhead Costs

The items which fall under the overhead category are the following:

- All salaries
- All personnel expenses
Certain repair and maintenance charges
Some power and fuel
Insurance, depreciation, interest, taxes, selling expenses, audit fee, etc.

The costs of the company are controlled by the seven classes listed below:

1. Material costs including freight costs are kept according to plants, by individual products, by sizes of products, and are controlled by each unit costs.

2. Oil costs including freight cost on oil are kept according to plants, by individual products and sizes, and are controlled by each unit costs.

3. Direct plant costs are kept by plants, by cost centers, by individual products, by foremen, and are controlled by each unit costs.

4. Plant overhead costs are kept according to plants, by various accounts, and are controlled by budget dollar amounts.

5. General overhead costs are kept according to individual departments, by various accounts, and are controlled by budget dollar amounts.

6. Procurement plant costs are kept by individual plants and separate accounts.

7. Sales storage yard costs are kept by separate accounts and plants.

All necessary adjustments and improvements in the budgeting of the costs were made the year direct costing was adopted in order to improve the reliability of the budget data. After the establishment of reasonably accurate variable overhead (direct cost) rates, a revision was made of
the standard costs in order to incorporate the variable rates into the standards.

This is followed by integrated profit planning on a direct costing basis, with detailed sales and production forecasts and profit plans. The basic policy which management now follows in the preparation of profit plans is that, prior to a new year, all levels of management participate in the preparation of cost center budgets up through to final profit plans. If the first forecast does not show adequate return, all the factors affecting profit, such as volume, product mix, variable and fixed costs are reviewed again for possible alteration. This procedure usually results in the preparation of different profit plans before acceptance by top management.

The emphasis laid upon such detailed and exhaustive planning led to another stage in the direct cost application; that is the redesigning of the financial reports to top management in order to incorporate the advantages of both the direct costing method and the detailed planning.

The redesigning of the financial reports appear to have a three-fold objective: namely, to pyramid the detail up through the various levels of management, to take full advantage of the analysis of volume-cost-price relationships
which only direct costing can provide, and also to report mainly on variance analysis principle in view of the detailed planning of operations.

**Planning and co-ordination of operations.**—The overall planning begins with the decision of which products to produce, when to produce them, and in what quantity. Behind this planning are the fixed costs of the organization which provide a setting for the activities of the organization and which in turn must be absorbed. The question of product planning is handled by the general manager of the plant, superintendent of the plant, and the vice president of sales. This group forms an informal committee and work out the planning together. The questions to be decided upon by this informal committee are many and varied but are related to classifications of product, quantity, and time. The problems of product mix and varied contributions of different products are also considered.

After the preliminary planning is done, the budget committee reduces the plan to a forecast from the sales, production, inventory, and financial aspects. Before the forecast is determined, a series of meetings gradually enlarging on the topics as they are clarified are held. In these meetings the executive vice president represents
co-ordination, the controller represents finance, and the vice president of sales represents market, and the general manager or the superintendent of the plant represent the product aspect of the budget. The entire planning focuses on the disposal problem of the sales division and the production problem of the plant superintendent. It is not attempted to determine the entire year's production at any single moment. However, successive meetings of similar nature are held in order to produce a reasonably accurate forecast for the immediate future.

The focal points of the entire procedure are the fixed costs and the contribution to profit. Upon the completion of each unit cost, the contribution of each product is known. Then it becomes the duty of the executive vice president to confer with sales and production constantly to alter plans and to stop the flow of certain work or restrict production as the trend of the market demand becomes known.

One can see at this point that co-ordination of sales and production is achieved at all times. The reason is that management is not so much concerned about what the company can produce at maximum efficiency. The reason is that there is keen competition in the wood preserving industry and the demand for the products and services of firms
in this industry is not expanding. The company under study generally operates at 75 per cent of its capacity. This capacity is considered adequate to keep sales supplied with the products and services in the quantity and quality desired and also to maintain production level that will absorb the direct labor employed to carry out the anticipated production, as set forth in the budget. Consequently, management is concerned about what the firm can produce and sell in order to cover overhead costs and at the same time provide reasonable profit.

The plans are thus consolidated and are also made flexible. The procedure goes through costing and pricing of each unit, requisitioning and purchasing of raw materials, employment of labor, and production planning throughout the plant. The organization is arranged in such a manner that facilitates the results of engineering and planning are tabulated and reported by the cost department. Control reports for efficiency on the operating levels and reports co-ordinating sales and production efforts to top executive levels are provided.

The divisions of sales, production, and finance, which are headed by the vice president of sales, general manager of the plant, and the controller, respectively, are
provided with the control reports of their individual divisions. The essential of co-ordination is emphasized in the final statements and analysis indicating the results of the efforts from the direct cost standpoint.

This method of planning and organizing the firm's activities gives the definite amount contributed to fixed cost and profits for each product. With the contribution of each sales section known and the amount necessary to cover overhead stated, management goes on to organize sales along the most profitable lines. The maximum selling price obtainable is invariably known; the material, labor, and overhead costs can be completed with reasonable accuracy. If it is necessary to store certain finished products because of unfavorable trends in the market, the responsibility of covering overhead (fixed) costs is placed at the door of sales department. The sales department must substitute other shipments having a contributory factor in excess of fixed costs if profit is to be maintained at the planned level. The reports to production includes analysis of material usage variances waste factors, labor efficiency and rate variances, and variable overhead (direct) variances. Reports to sales show contributions by products, and selling expenses, and those to top management provide break-even and
profit volume analysis, together with reports on plant operation. Thus, management is provided with adequate information and the required knowledge to make decisions with greater confidence.

**Recording and accounting procedure.**--The accounting and recording procedure of the firm is designed to provide a basic simplicity of operation that reduces clerical work to the minimum without affecting availability of sufficient data required for analysis and for the establishment and maintenance of effective control.

The chart of accounts is drawn up to include only needed accounts for clarity and to provide the grouping necessary for proper balance sheet and income statement analysis. The main divisions the chart includes are the balance sheet items, direct costs, and overhead costs. Each of these divisions is maintained in control form in the general ledger and the classification is followed in the subsidiary ledgers which are kept according to plants and by separate accounts.

In designing this procedure of carrying out the recording and accounting, two points are always borne in mind, namely, an effort to secure minimum information necessary for effective recording and control, and the means whereby
this objective can be achieved with the least possible time and effort. In order to achieve this objective, time saving devices like accounting machines, control tape, and various types of pre-list forms with all the necessary columnar headings are installed wherever possible.

The daily records of the cost department shows the movement of raw material and work-in-process inventory according to the reports made through work tickets by the various cost centers. There are nine cost centers through which the operation costs of the plant are recorded and controlled. Eight of these centers are direct cost centers; whereas, the other is the overhead cost center.

Direct Cost Centers

1. **Unload and Stack**
   
   This is a cost center in which various types of wood are received from the forest. The wood is shipped to this point by truck and rail. The foremen in this center are responsible for unloading and stacking the wood by type and size.

2. **Control at Seasoning**
   
   This is a center in which the wood is dried by means of artificial process. Normally, companies in the wood preserving industry dry their wood in the sun, but the
company under study has developed an artificial method of drying its wood. This process reduces the time required for drying the wood and also helps to cut down the fund which would be tied up in inventory.

3. Adz and Bore
In this center the wood is cut into desirable shapes and sizes. It is here that the wood is chipped to make floor-blocks. In the case of the crossties, after the wood is cut into the right size and shape, holes are made through by boring according to customer specification.

4. Frame and Dress
The function of this center is to make holes through the poles. The holes are made according to the specification of each customer. It is also at this center that the surface of the lumber produced is made smooth by dressing.

5. Handling
The foreman in this cost center is responsible for handling the movement of wood and other materials from one cost center to other cost centers.

6. Treating and Boiler Rooms
This is a cost center in which the wood is oil treated. The wood is pressure treated at correct temperature and right time cycle. The equipment used in this center is
regulated to remove excess oil from the finished product.

7. **Storage Cost Center**

Storage is the place to which finished units are transferred from their final stage of production. Finished units will be kept here until they are shipped to customers.

8. **Shipping Cost Center**

The function of this center is to see to it that finished units are delivered to customers on time.

9. **Overhead Cost Center - Office**

At this cost center, all overhead at the plant is recorded in total and controlled by budget.

The purpose of these cost centers is to enable the foremen and supervisors to have a control over the costs incurred in the section of the plant for which they are responsible. This also encourages each foreman to do his level best to keep per unit cost constant, if possible, lower, regardless of quantities handled in each cost center. The direct cost centers include the direct hourly paid labor, supplies, repairs and maintenance on equipment in the related center, and power and fuel cost wherever it is possible to measure.

The summary of these daily work sheets is entered in
what is called "End of Month Journal Voucher" and this forms the basis of the monthly cost ledger entries.

The end of month journal voucher indicates the plant, the date, and the cost center. Columns are provided for the product, account number, factory labor, direct labor allowance, total labor, supplies, fuel and power, and total cost. After the data in the journal voucher columns are added and balanced, the costs are then posted to "the monthly cost and variance statements."

The monthly cost and variance statement is divided into two headings. The two headings are "current month direct cost" and "year to date." Under the current month direct cost heading, columns are provided for recording unit cost, quantity of material consumed, actual spending for the month, planned spending, standard unit cost, and variance in amount and unit cost. Under the year to date heading, columns are provided for actual spending, quantity consumed, and unit cost. Then each quarter, the cost centers are re-capped by individual products and quarterly product cost and variances are computed. Then the product costs are transferred to income statement. An example of the type of income statement prepared in the company is shown in Exhibit 1.
EXHIBIT 1
INCOME STATEMENT
For the Quarter Ended February 28, 1967

<table>
<thead>
<tr>
<th>Poles</th>
<th>Crossties</th>
<th>Lumber</th>
<th>Switchties</th>
<th>Post</th>
<th>Crossarms</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>Sales</td>
<td>Sales</td>
<td>Sales</td>
<td>Sales</td>
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<td>Sales</td>
</tr>
<tr>
<td>Oil</td>
<td>Oil</td>
<td>Oil</td>
<td>Oil</td>
<td>Oil</td>
<td>Oil</td>
<td>Oil</td>
</tr>
<tr>
<td>Direct Contribution</td>
<td>Direct Contribution</td>
<td>Direct Contribution</td>
<td>Direct Contribution</td>
<td>Direct Contribution</td>
<td>Direct Contribution</td>
<td>Direct Contribution</td>
</tr>
</tbody>
</table>

TOTAL CONTRIBUTION

Less
- Plant Overhead

Less
- General Overhead

Profit Before Taxes

Less
- Income Taxes

Profit or Loss
Establishment of standard unit cost.--In the establishment of standard costs, the combined efforts of operating, engineering, and accounting personnel are fully utilized.

After the bill of materials is developed for each product, the raw material requirements are entered on the stock bill and details of wood including dimension are noted. In addition to wood requirements, the quantity of oil required is determined. The material computed is the net figure, which with the addition of reasonable allowance for waste makes the material section of the standard cost card.

In determining the standard labor required, a similar detailed approach is followed. First, the personnel requirement of each process is determined. Then each type of work in the plant is identified and payroll classification which applies to direct labor is noted. The sequence of operations is listed for each product and the time required for each operation is carefully computed and extended on the specification and routing sheet. Each process, machine, and handling operation in the company has been under intensive time study for many years. Therefore, there is adequate information on each operation showing the time required for every width, thickness, and type of wood.
generally encountered. From information such as the foregoing, the standard labor is developed.

In computing the standard labor, an attempt is made to provide reasonable allowance to permit a gain on standards with maximum effort. This enables management to pay an incentive bonus. The final summary of labor cost is then entered on the labor estimate sheet and, in turn, is carried to the standard cost card.

The application of variable manufacturing overhead completes the calculation of the standard unit cost. The cards are then filed by number and thus form the basis of recording and measuring operations.

The engineering department is required to constantly check on the practical application of the standard by time study methods and to also work out and apply modifying percentages whenever conditions make normal standards impossible. In addition, this department devises economical methods of treating poles, posts, making crossties, etc. in order to reduce cost and to facilitate more rapid and accurate costing.

The information obtained from the standard unit cost is used throughout the operations of planning and production. For instance, by using the standard unit cost, management is able to set target selling price for the products of the
company, plan contribution of each product to fixed costs and profit, determine material and labor requirements.

Establishment of target selling price and knowledge of the approximate contribution to overhead and profits enables management to plan its sales mix and anticipate the results. Determination of material and labor requirements inform management about approximate percentage of plant capacity used. Hence, all forward planning or the results of any change in plan can be drawn up with confidence and the necessary action can be taken.

Material.--The raw material of the company is made up of different types of wood and oil. These items are under the direct control of the procurement department, which not only negotiates the acquisition of new materials but also receives reports from the stores and inventory control.

The main function of this department is to purchase advantageously and to make sure that material is available in the quantity and quality needed. This department is always activated by the receipt of requisitions for material. These requisitions come from the various section foremen requiring factory supplies.

The primary planning done in the process of
establishing the standard cost provides all information necessary for making the requisitions and approving them. In any case, careful attention is given to the existing inventory and requisition is made only after a careful review of the condition shown by the inventory control reports. In all cases, the requisitions are reviewed by the superintendent before they are submitted to the purchasing department. Since the material requirement for each product is set by the standard, a continuing effort is made to control cost within the established limits.

Material quality control is maintained through the research department. Invoices, before they are passed for entry and payment, are required to have attached the carbon copy of the order form, the shipping copy, and receiving slip. In addition, each invoice must bear initials to show that extensions, footings, price, quality are in order. The document is then routed to research department for quality approval, procurement department for price, costing department for account classification and standard cost, and then to accounting for entry and payment.

Inventory control is maintained by reports on monthly basis but stock records are available for checking purposes at anytime.
The price variance is obtained by comparing the standard and actual totals in the purchase journal. A monthly report giving the detail under appropriate headings is used for the purposes of analysis of the variance on a monthly and cumulative basis.

The usage variance is determined by an analysis of raw material requisitions against the standard material required. This variance is considered very important in view of the fact that it enables management to evaluate the adequacy of the established allowance for waste.

The waste factors are percentages obtained by the engineers as a result of years of engineering study and experience. The application of these factors in the calculation of the standard unit cost is very essential part of material cost computation. The study of usage variance is the most obvious method of testing their adequacy. Hence, each usage variance is checked against material quality and shop performance whenever any decision is made to make adjustment in allowance for waste factors.

**Direct Labor.**—Each operator is paid on the basis of his individual time card. Variances are finalized every month on completion of the labor analysis sheet, which takes into consideration the movement of labor to various sections
as reported on the time sheets, and all necessary deductions from direct labor. These deductions are for items like paid holidays, vacations, etc. The final result of the analysis shows the hours, and amount of labor for each department during the month, together with indirect labor (overhead) segregated by account. Against this, the labor content of the production, recorded from production tickets, is entered daily and accumulated on a monthly basis. The record of daily production, in terms of direct labor hours, provides the basis for the daily measurement of plant activity. It also indicates the departmental efficiency variance which is the most important information in keeping management informed about the current activity of the plant.

A further refinement of the daily computation of standard labor produced is the employee bonus sheet. This records the value of end production in standard hours at actual rates. Against this is compared the actual labor hours in the day at actual rates. These are obtained by computing the direct hours of the individual direct workers at their respective rates. The net result, gain or loss in direct labor hours at actual rate, is credited or charged to the bonus payable.

This plan of paying the workers for any gain that
they make creates keen interest in them and encourages them to find short cuts and results in very close co-operation between groups to foster increased production. The end production is then used to ensure correct processing of all materials throughout all processes so that no rejection of products or delays are possible without affecting the bonus. This makes each worker turn out perfect finished products.

Manufacturing overhead cost.—As already indicated, variable overhead costs in the plant are simply classified as direct costs, whereas the fixed costs are classified as overhead. As a matter of fact, management recognizes only two types of costs, namely, direct and overhead costs.

In order to save work on petty details and lend more emphasis on controllable costs, the factory ledger accounts are limited in number. Consequently, accounts are presented as a division total, leaving analysis, wherever necessary for accounting control, as a subsidiary presentation.

The analysis between overhead and direct costs assumes possibly great importance as it is normal with the direct costing method. This becomes obvious when there is a problem of how to classify border-line cases. In classifying costs which are border-line cases, management uses
its own judgment based on past experience and thereby classifies such costs as direct or overhead costs.

Departmental analysis of manufacturing costs does not appear to be emphasized. It is true that the efficiency of each department is carefully measured, but since a large portion of the costs are eliminated as overhead costs, there remains only to ascertain that applied direct cost is covering the actual departmental share. Segregated as costs are, under this costing method, the control is simplified greatly. In all eight direct cost centers, only basic supplies, repair and maintenance on equipment, and power and fuel are of any importance.

The departmental analysis is, however, particularly desirable in checking the variable overhead rate stated on the standard cost card. This rate is significant in the correct valuation of in-process inventory in all stages of production. The distinct advantage of direct costing is seen at this point in that it is no longer desirable to hold in-process inventory at only material value on the ground that it is not completed and has not reached potentially saleable stage. Proper cost control requires instant valuation of in-process inventory at the correct value.

Under the direct costing method which the firm under
study is using, this is normal procedure. Consequently, management is able to determine the cost of a product in-process in any section of the plant, any time, and at any stage.

All salaries, insurance, local taxes, rent, depreciation, and a number of items of similar nature are classified as overhead. As long as the plant is operating, these costs are expected to be present. It matters very little if the plant is operating at full or partial capacity, these costs will continue to exist.

It is important to note at this point that the variable overhead (direct cost) rate, which is set up on the basis of past performance, is evaluated very carefully as the actual performance for the period becomes known. Management is very much satisfied, because in most cases the variable overhead rate applied to planned operation has been remarkably close to the requirement of actual operation.

The most significant division of the cost analysis is the overhead cost (fixed burden). Since it is segregated from the other operation costs, it is always regarded as the focal point of the entire operation. In the final analysis, it becomes the responsibility of the sales department to sell sufficient volume in order to overcome all overhead
costs. The means to accomplish this objective enforce the keenest analysis and the closest co-operation between the production and selling personnel.

Illustration of profit planning and reporting procedure.—The selection of the product and the price at which each product should be sold is essentially the problem of the sales division. This is of such importance that, in most cases, determines the success or failure of the total operation of the company. The company must sell and make reasonable profit in order to continue operation.

To illustrate how profit is planned and computed in this company, let us assume that management decided to make and sell 2,000,000 crossties at a direct cost of $3.00 each and a sales price of $4.00 each. This plan is computed as follows:

Sales 2,000,000 crossties at $4.00 each = $8,000,000
Less Direct Cost 2,000,000 crossties at $3.00 each = $6,000,000
Contribution $2,000,000

At this point, management decides how much overhead cost it should allow. Assuming further that the plan calls

1Data taken from material used in teaching supervisors and foremen.
for a profit before taxes of $1,000,000, according to the practice in the company, the overhead cost must be $1,000,000. The complete profit plan covering the 2,000,000 crossties is prepared as follows:

**Profit Plan**

*(For 2,000,000 Crossties)*

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales at $4.00 each</td>
<td>$8,000,000</td>
<td>100.0</td>
</tr>
<tr>
<td>Less Direct Cost at $3.00 each</td>
<td>6,000,000</td>
<td>75.0</td>
</tr>
<tr>
<td>Contribution</td>
<td>2,000,000</td>
<td>25.0</td>
</tr>
<tr>
<td>Less Overhead</td>
<td>1,000,000</td>
<td>12.5</td>
</tr>
<tr>
<td>Profit before Income Taxes</td>
<td>1,000,000</td>
<td>12.5</td>
</tr>
<tr>
<td>Less Income Taxes at 52 per cent</td>
<td>520,000</td>
<td>6.5</td>
</tr>
<tr>
<td>Net Income</td>
<td>480,000</td>
<td>6.5</td>
</tr>
</tbody>
</table>

We can see from the foregoing profit plan that any sale under $4.00 each, any quantity sold less than 2,000,000 units, any direct cost over $3.00 each, or any dollar spent over the $1,000,000 overhead will directly reduce the net income. In the same way, any increase in the selling price or quantity sold will be automatically reflected in the profit.
The $3.00 direct cost is made up of the following items:

(a) The cost of wood in the forest and freight-in $2.50 each
(b) Cost of oil placed into wood .25 each
(c) Plant direct cost to finish a crosstie .25 each

Total Direct Cost $3.00

Plant direct cost covers the hourly paid labor, supplies, repairs and maintenance, power, and fuel costs incurred to unload and stock, air dry, adz and bore, treating and boiler rooms, storage, and shipping costs which are allocable to the crosstie.

The $1,000,000 overhead cost is made up of (a) all salaries for officers, plant manager, supervisors, foremen, office, salesmen, research, traffic, engineers, buying, and inspecting personnel, (b) insurance, local taxes, rent, depreciation, and a number of other costs of similar nature.

The $1,000,000 dollar overhead is not considered as part of the cost of any one crosstie. It is the cost of all crossties. As understood by the management, direct cost states that the company has a direct cost of $3.00 for each crosstie it produces and it must sell 2,000,000 units at $4.00 each in order to carry a $1,000,000 worth of overhead cost and to earn a profit before income tax amounting to
$1,000,000. This $1,000,000 overhead cost is the cost of being in business in order to be in a position to produce and sell all the firm can sell.

The foregoing example is fairly simple, because only one type of product is considered. The advantage of direct costing is seen very clearly when all the twelve different types of products which the company produces and sells are considered. The reason is that since the company makes twelve different types of products of varying sizes each year, any attempt to pro-rate or "guess" at what amount of the $1,000,000 overhead cost should be applied to each product, each size, and each quantity would give one many different costs.

This brings forth the question--what are costs for? The main purpose of the costs as used by management is to see if the sales price is adequate. The selling price of the company's products is affected by many factors other than the costs of the products in the company. Some of these factors are current thinking of the prospective and actual customers of the company, and the general trend in the industry.

In the foregoing illustration, the overhead cost is $1,000,000 and the contribution is $2,000,000. The
40

contribution is 25 per cent of sales. By dividing 25 per cent into the overhead, one can determine the sales volume at which the company breaks-even: $1,000,000/25 per cent = $4,000,000.

This means the firm could lose 50 per cent of its present sales volume on the crossties and still break-even, provided the selling price of each crosstie and the direct cost remains constant. Loss in sales volume by itself does not change either the $4.00 or the $3.00 direct cost. This information is considered very essential for management to see the firm’s margin of safety. The break-even chart is used by the controller’s office when a report is prepared for top management. The reason for using the break-even chart is to enable top management see the picture very vividly.

Management knows the volume of sales at which the firm breaks-even and can minimize cost of production by means of incentive bonus. This enables the firm to give price concessions and thereby make more profit by taking advantage of increased volume of sales. As a result, the company is able to make 5 per cent higher profit than 64 per cent of the firms in the industry.

**Method of establishing target selling price.**
Management uses direct costing in setting the target prices for the products of the firm. As indicated in the foregoing illustration, at normal sales volume, overhead is 12.5 per cent and planned profit before income taxes is also 12.5 per cent of sales. If we assume that management decided to have a total mark-up of 25 per cent, the selling price will be computed as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 unit crosstie known wood cost</td>
<td>$2.50</td>
</tr>
<tr>
<td>1 unit crosstie known oil cost</td>
<td>.25</td>
</tr>
<tr>
<td>1 unit crosstie known plant direct cost</td>
<td>.25</td>
</tr>
<tr>
<td><strong>Total Direct Cost</strong></td>
<td><strong>$3.00</strong></td>
</tr>
<tr>
<td>Direct Cost 75 Per Cent is</td>
<td><strong>$3.00</strong></td>
</tr>
<tr>
<td>Selling Price 100 Per Cent Will be</td>
<td><strong>4.00</strong></td>
</tr>
<tr>
<td><strong>Contribution 25 Per Cent</strong></td>
<td><strong>$1.00</strong></td>
</tr>
</tbody>
</table>

The 25 per cent contribution needed and earned covers the 12.5 per cent overhead and provides 12.5 per cent profit.

The foregoing illustration shows that direct costing enables management to obtain break-even point on any type of product and the combination of product mix. The union of sales with production is always kept in mind when considering the profit obtainable from different mix.

The entire consideration of profit is linked closely with budgeting and results in the general budget for the
year. Modification of this, as the actual sales needs are felt, gives rise to further considerations of sales results and the adjustment of production necessary to achieve the plans. It is possible to predict the results of these changes quite readily, in terms of contribution, by application of the standard cost and to consider further and revise the results of operations with a view to increasing profit as the result of plans become evident. The final outcome, incorporated in the budget, is subjected to comparative methods as the actual activity progresses.

Consideration of profit resulting from operations forms the focal point of all planning and comparison of the desired result with the actual provision of information essential to revisions of the original plan for maximum results.

The firm uses direct costing in determining its cost of sales and inventory used in financial statements for internal reporting purposes.

**Inventory valuation.**—The company uses direct costing in valuing inventory for internal reporting. The procedure followed is shown in Exhibit 2.

The value of inventory for internal reporting will be $5.90. However, for external reporting, the portion of
overhead which should be allocated to the units of cross-ties in inventory is added. This overhead is determined by using a formula established by the management of the company and approved by the income tax authorities.

EXHIBIT 2

<table>
<thead>
<tr>
<th>Crosstie</th>
<th>Quantity</th>
<th>Material Cost</th>
<th>Oil Cost</th>
<th>Direct Plant Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 5</td>
<td>1</td>
<td>2.50</td>
<td>.25</td>
<td>.25</td>
<td>3.00</td>
</tr>
<tr>
<td>Grade 4</td>
<td>1</td>
<td>2.50</td>
<td>.15</td>
<td>.25</td>
<td>2.90</td>
</tr>
</tbody>
</table>

Material Cost $5.00  
Oil Cost .40  
Direct Cost .50  

Total Inventory $5.90

Reporting.--The monthly, quarterly and annual reports prepared are characterized by brevity and simplicity. The reports eliminate extraneous and confusing matter and also save a great deal on clerical work.

The monthly reports submitted to the executive vice president are the balance sheet, income statement, and inventory details. The vice president of sales receives
details on sales, selling expenses, and inventory details.

The general manager of the plant and the superintendent receive reports on manufacturing costs, variance report on wood and oil usage, variance report on other usage, variance report on labor price, and report on labor efficiency variance.

The purchasing department receives reports on inventory details and variance report on purchase price.

As indicated above, the statement to top management provides a summary of operations which is free of detail. The other reports enlarge on this. The report on the manufacturing cost gives the detail of the applied manufacturing cost at the standard rate multiplied by standard production hours against actual direct costs and furnishes information by which the actual performance can be checked. The reports to other divisions heads emphasize the details required to control their respective divisions. This, supplemented by weekly progress reports on the use of labor, provides adequate information for efficient control.
CHAPTER III

SUMMARY AND CONCLUSIONS

The role of modern management is planning and controlling business activities in an environment in which the only constant is change. There is continuous change in the size of business organizations, market conditions, labor requirements, methods of production and distribution. This dynamic nature of modern economic system requires management to be constantly on the alert. There is constant need for up-to-date and reliable facts on which management can base its decisions. The need for such information created further need for improvement in the information flow on which executive actions can be guided.

Direct costing is one of the techniques in accounting which has been developed to assist management to meet these additional challenges in securing prompt and reliable data in an effort to effect sound planning and controlling business operations.

Direct costing is not accepted either by the American Institute of Accountants or by the Income Tax authorities for
external reporting purposes. However, it has attained the status of an accepted technique for internal reporting to management.

The main criticism against this method of costing is that inventory values are understated in comparison to the absorption costing. On the other hand, under direct costing with only the direct costs moving through inventory and cost of sales, the distortion caused by varying levels of production and sales is eliminated. This method also provides the basic data necessary for the analysis of the complex interrelationship of volume, price, and cost in the determination of profit.

The company in this case study adopted the direct costing method because management was convinced that reports made on direct costing basis are easier to understand even for those members of management who do not know much accounting. In addition to facilitating instant valuation of inventory, this method also permits clear-cut responsibility accounting. Moreover, direct costing makes easy the process of forward planning, and co-ordination of production and sales activities.

The implementation of the conversion to direct costing was effected by explaining to the foremen, supervisors,
and top management how the method works. Then, the operation costs of the company were classified into direct and overhead costs. The direct costs are controlled through the eight direct cost centers, whereas the overhead costs are controlled by the budget at the head office.

The purpose of the conversion to direct costing is to install simple, efficient, and readily effective methods for cost control which provides management, at least clerical effort, with the necessary information to correct any deviation from its plan. With this objective in mind, management first established standard unit cost of material, labor, and variable overhead. Using the standard unit cost, management determines target selling price, contribution to overhead and profit, material and labor requirement. Thus, a great deal of emphasis is laid upon detailed and exhaustive planning. The method is designed to inform management of the results of existing conditions and the means by which any unfavorable trends can be corrected. The financial reports are designed in such a way that reports are made mainly on variance analysis principle in view of detailed planning of operations. The reports to top management provide a summary of operations which is clear of detail. The reports to the various subdivisions emphasize the details
necessary to control their respective sections. The costing method is also designed to ensure prompt assembly and forwarding of reports to management.

The emphasis on direct costs makes readily available that most potent feature of modern operations, namely, the contribution to overhead and profit. This facilitates the co-ordination of sales and production efforts. The ease by which the break-even and profit-volume relationship of any type of product mix may be obtained is a desirable and essential feature of planning and cost control by direct costing.

There is ample provision in the analysis of overhead to prevent unwarranted waste and ensure adherence to the budget. At the same time, exhaustive analysis is not attempted, as any indication of deviation from a desired line is readily seen. Any deviation observed serves as a notice for management to regain and retain complete control.

The method has facilitated the valuation of inventory at various stages of completion. There is no danger of overvaluation of inventory, but at the same time each section of production receives prompt credit for the inventory it processed. The most serious objection raised against the use of direct costing for external reporting
purposes is that inventory value is understated. The company under study solved this problem by simply taking the value of inventory on direct costing and adding to it the portion of overhead allocable to the ending inventory. The allocable portion of overhead is computed by using a formula developed by the company and approved by the Internal Revenue Service.

The most illuminating feature of direct costing as used by the company is the segregation and presentation of overhead costs. It makes it easy for management to realize the extent of overhead and the extent of effort that must be devoted in order to overcome these costs before any profit is realized.

The emphasis on the break-even point and the profit-volume relationship stands as a constant warning to management of the margin by which the existing sales exceed the break-even point. This enables management to know the appropriate time and condition to give price concessions in order to take advantage of increased volume of sales. Thus, the important feature of direct costing as used by the firm is that it is designed in such a manner that it is always ready to provide the information required to support management decisions and actions.
Management recognizes only two types of costs, namely, direct and overhead costs. The direct cost is made up of the cost of wood, cost of oil placed into the wood, and the direct plant cost incurred to finish the product. All other costs which cannot be classified as any of the above items are considered overhead. The costs of wood and oil are controlled by product and unit cost. The direct plant cost is controlled by product, by cost center, by foreman, and per unit cost, whereas the overhead is controlled by budget dollar amounts. The classification of the costs is simple and at the same time adequate for control purposes.

Operators are paid on the basis of their individual time cards. Each operator receives bonus for performance over and above the standard. Such payment of bonus is made on the basis of the departmental foreman’s daily efficiency report. The method thus facilitates the procedure to motivate and control the individual operator’s performance.

The fact that reports are made mainly on a variance principle, because of detailed planning, the information furnished to the executives for their use as control tools enables them to distinguish between those areas that are progressing satisfactorily, and according to plan, and which consequently need relatively little attention, and those
areas in which performance is unsatisfactory and to which management’s direct attention is required. Direct costing as used by the firm facilitates the preparation of cost break-downs showing when, where, and what happened. It also enables management to determine the contribution of each product to overhead and profit.

The firm’s experience supports the premise that the application of direct costing in planning and controlling business activities can be used to considerable advantage. Management is extremely satisfied with its experience with direct costing and has shown interest in continuing to use it. Direct costing facilitates the preparation of simple, informative, logical, and clear-cut financial reports—the kind of reports which modern managers desperately need in order to make sound decisions.

Though lacking general acceptability by the major accounting bodies, direct costing’s long run test as a valid technique, concept, or method must be in terms of its application to problems faced by managers in the real world. This case study points to one example of a company’s exploration in validating a concept’s merit by practical application.
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