Cost and Management Accounting
This book is a part of the course by Jaipur National University, Jaipur. This book contains the course content for Cost and Management Accounting.

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**Abbreviations**

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<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ABC</td>
<td>Activity-Based Costing</td>
</tr>
<tr>
<td>CVP</td>
<td>Cost Volume Profit</td>
</tr>
<tr>
<td>DLCV</td>
<td>Direct Labour Cost Variance</td>
</tr>
<tr>
<td>DMCV</td>
<td>Direct Material Cost Variance</td>
</tr>
<tr>
<td>EPS</td>
<td>Earnings per share</td>
</tr>
<tr>
<td>LCV</td>
<td>Labour Cost Variance</td>
</tr>
<tr>
<td>MMV</td>
<td>Material Mix Variance</td>
</tr>
<tr>
<td>MPV</td>
<td>Material Price Variance</td>
</tr>
<tr>
<td>MUV</td>
<td>Material Usage Variance</td>
</tr>
<tr>
<td>MYV</td>
<td>Materials Yield Variance</td>
</tr>
<tr>
<td>OCV</td>
<td>Overhead Cost Variance</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on Assets</td>
</tr>
<tr>
<td>ROE</td>
<td>Return on Equity</td>
</tr>
<tr>
<td>VOEV</td>
<td>Variable Overhead Expenditure Variance</td>
</tr>
</tbody>
</table>
Chapter I
Management Accounting

Aim
The aim of this chapter is to:

• explicate the concept of management accounting
• explain the importance of accounting
• elucidate the need for management accounting

Objectives
The objectives of this chapter are to:

• examine the evolution of management accounting
• analyse the process of accounting
• enlist the benefits of management accounting

Learning outcome
At the end of this chapter, you will be able to:

• define funds flow
• understand the importance of management accounting
• identify various ratio analysis
1.1 Introduction

Management accounting can be viewed as Management-oriented Accounting. Basically it is the study of managerial aspect of financial accounting, “accounting in relation to management function”. It shows how the accounting function can be re-oriented so as to fit it within the framework of management activity. The primary task of management accounting is, therefore, to redesign the entire accounting system so that it may serve the operational needs of the firm. It furnishes definite accounting information, past, present or future, which may be used as a basis for management action. The financial data are so devised and systematically development that they become a unique tool for management decision.

1.2 Definition of Management Accounting

The term “Management Accounting”, observe, Broad and Carmichael, covers all those services by which the accounting department can assist the top management and other departments in the formation of policy, control of execution and appreciation of effectiveness. This definition points out that management is entrusted with the primary task of planning, execution and control of the operating activities of an enterprise. It constantly needs accounting information on which to base its decision. A decision based on data is usually correct and the risk of erring is minimised. The position of the management in respect of its functions can be compared to that of an army general who wants to wage a successful battle.

A general can hardly fight successfully unless he gets full information about the surrounding situation and the extent of effectiveness of each of his battalions and, to the extend possible, even the enemy’s intentions. Like a general, a successful management too strives to outstrip other competitors in the field by streamlining its operating efficiency. It needs a thorough knowledge of the situation and the circumstances in which the firm operates. Such knowledge can only be gained through the processed financial data rendered by the accounting department on the basis of which it can take policy decision regarding execution, control, etc. It is here that the role of management accounting comes in. It supplies all sorts of accounting information in the form of such statements as may be needed by the management. Therefore, management accounting is concerned with the accumulation, classification and interpretation of information that assists individual executives to fulfil organisational objectives.

An analysis of the above definition shows that management needs information for better decision-making and effectiveness. The collection and presentation of such information come within the area of management accounting. Thus, accounting information should be recorded and presented in the form of reports at such frequent intervals, as the management may want. These reports present a systematic review of past events as well as an analytical survey of current economic trends. Such reports are mainly suggestive in approach and the data contained in them are quite up to date. The accounting data so supplied thus provide the informational basis of action. The quality of information so supplied depends upon its usefulness to management in decision-making. The usual approach is that, first of all, a thorough analysis of the whole managerial process is made, then the information required for each area is explored, and finally, all the information, after analysis in terms of alternatives, is taken into consideration before arriving at a management decision. It is to be understood here that the accounting information has no end in itself; it is a means to an end. As its basic idea is to serve the management, its form and frequency are all decided by managerial needs. Therefore, accounting aids the management by providing quantitative information on the economic well being of the enterprise. It would be appropriate if we called management accounting an Enterprise Economics. Its scope extends to the use of certain modern sophisticated managerial techniques in analysing and interpreting operative data and to the establishment of a communication network for financial reporting at all managerial levels of an organisation.

1.3 Nature of Management Accounting

The term management accounting is composed of ‘management’ and ‘accounting’. The word ‘management’ here does not signify only the top management but the entire personnel charged with the authority and responsibility of operating an enterprise. The task of management accounting involves furnishing accounting information to the management, which may base its decisions on it. It is through management accounting that the management gets the tools for an analysis of its administrative action and can lay suitable stress on the possible alternatives in terms of costs, prices and profits, etc. but it should be understood that the accounting information supplied to management is not the sole basis for managerial decisions. Along with the accounting information, management takes into
consideration or weighs other factors concerning actual execution. For reaching a final decision, management has to apply its common sense, foresight, knowledge and experience of operating an enterprise, in addition to the information that is already has.

The word ‘accounting’ used in this phrase should not lead us to believe that it is restricted to a mere record of business transactions, i.e., book keeping only. It has indeed a ‘macro-economic approach’. As it draws its raw material from several other disciplines like costing, statistics, mathematics, financial accounting, etc., it can be called an interdisciplinary subject, the scope of which is not clearly demarcated. Other fields of study, which can be covered by management accounting, are political science, sociology, psychology, management, economics, statistics, law, etc. A knowledge of political science helps to understand authority relationship and responsibility identification in an organisation. A study of sociology helps to understand the behaviour of man in groups. Psychology enables us to know the mental make-up of employers and employees.

A knowledge of these subjects helps to increase motivation, and to control the actions of the people who are ultimately responsible for costs. This builds a better employer-employee relationship and a sound morale. The subject of management reveals the processes involved in the art of managing, knowledge of economics assists in the determination of optimum output in the forecasting of sales and production, etc., and also makes it possible to analyze management action in terms of cost revenues, profits, growth, etc. It is with the help of statistics that this information is presented to the management in a form that can be assimilated. The subject of management accounting also encompasses the subject of law, knowledge of which is necessary to find out if the management action is ultra-virus or not. It is, therefore, a wide and diverse subject. Management accounting has no set principles such as the double entry system of bookkeeping. In place of generally accepted accounting principles, the philosophy of cost benefit analysis is the core guide of this discipline. It says that no accounting system is good or bad but is can be considered desirable so long as it brings incremental benefits in excess of its incremental costs. Applying management accounting principles to financial matters can arrive at no single perfect solution. It is, therefore, an inexact science, which uses its own conventions rather than standardised principles. The facts to be studied here can be interpreted in different ways and the precision of the inferences depends upon the skill, judgment and common sense of different management accountants. It occupies a middle position between a fully matured and an infant subject. The various other ways to summarise nature of management accounting are given below:

- Forecasting: It is not confined only to the collection of historical data or facts but also attempts to highlight upon “What should have been”.
- Supply information: It provides information to the management and not decision.
- Increase in efficiency: It is basically concerned with “the problem of choice”.
- Techniques and concepts: It uses special techniques and concepts to make accounting data more useful.
- Cause and effect analysis: It attempts to examine the “cause” and “Effect” of different variables. This may be the reason that management accounting is called as science.
- No fixed norms: No set of rules and formats like double entry system of bookkeeping.
- Assists management: It assists management in several ways in its functions but does not replace it.
- Achieving of objectives: The principal objective is to “serve the needs of management”.

Management accounting is highly sensitive to management needs. However, it assists the management and does not replace it. It represents a service phase of management rather than a service to management from management accountant. It is rather highly personalised service. Finally, it can be said that the management accounting serves as a management information system and so enables the management to manage better.

### 1.4 Functions of Management Accounting

The basic function of management accounting is to assist the management in performing its functions effectively. The functions of the management are planning, organising, directing and controlling. Management accounting helps in the performance of each of these functions in the following ways:

- Provides data: Management accounting serves as a vital source of data for management planning. The accounts and documents are a repository of a vast quantity of data about the past progress of the enterprise, which are a must for making forecasts for the future.
• Modifies data: The accounting data required for managerial decisions is properly compiled and classified. For example, purchase figures for different months may be classified to know total purchases made during each period product-wise, supplier-wise and territory-wise.

• Analyses and interprets data: The accounting data is analysed meaningfully for effective planning and decision-making. For this purpose the data is presented in a comparative form. Ratios are calculated and likely trends are projected.

• Serves as a means of communicating: Management accounting provides a means of communicating management plans upward, downward and outward through the organisation. Initially, it means identifying the feasibility and consistency of the various segments of the plan. At later stages it keeps all parties informed about the plans that have been agreed upon and their roles in these plans.

• Facilitates control: Management accounting helps in translating given objectives and strategy into specified goals for attainment by a specified time and secures effective accomplishment of these goals in an efficient manner. All this is made possible through budgetary control and standard costing which is an integral part of management accounting.

• Uses qualitative information: Management accounting does not restrict itself to financial data for helping the management in decision making but also uses such information which may not be capable of being measured in monetary terms. Such information may be collected from special surveys, statistical compilations, engineering records, etc.

1.5 Scope of Management Accounting

Management accounting is concerned with presentation of accounting information in the most useful way for the management. Its scope is, therefore, quite vast and includes within its fold almost all aspects of business operations. However, the following areas can rightly be identified as falling within the ambit of management accounting:

• Financial accounting: Management accounting is mainly concerned with the rearrangement of the information provided by financial accounting. Hence, management cannot obtain full control and coordination of operations without a properly designed financial accounting system.

• Cost accounting: Standard costing, marginal costing, opportunity cost analysis, differential costing and other cost techniques play a useful role in operation and control of the business undertaking.

• Revaluation accounting: This is concerned with ensuring that capital is maintained intact in real terms and profit is calculated with this fact in mind.

• Budgetary control: This includes framing of budgets, comparison of actual performance with the budgeted performance, computation of variances, finding of their causes, etc.

• Inventory control: It includes control over inventory from the time it is acquired till its final disposal.

• Statistical methods: Graphs, charts, pictorial presentation, index numbers and other statistical methods make the information more impressive and intelligible.

• Interim reporting: This includes preparation of monthly, quarterly, half-yearly income statements and the related reports, cash flow and funds flow statements, scrap reports, etc.

• Taxation: This includes computation of income in accordance with the tax laws, filing of returns and making tax payments.

• Office Services: This includes maintenance of proper data processing and other office management services, reporting on best use of mechanical and electronic devices.

• Internal Audit: development of a suitable internal audit system for internal control.

1.6 Financial Analysis and Planning

Financial analysis and planning is carried out for the purpose of obtaining material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise and is necessary to analyse the data depicted in the financial statements. The main tools are Ratio Analysis, Cash Flows and Fund Flow Analysis.
1.7 Management Accounting Tools

A ratio is one variable measured in terms of another, for example, how many girls are in a class compared to the number of boys. Ratio analysis is one tool in the strategic decision making process. Management accountants use ratios along with other internal business data and publicly available information to assess aspects of a company’s performance.

The main ratios used in management accounting are:

- Efficiency or activity ratios, including liquidity: This show whether the business is able to pay its debts. They look at whether the assets of the company (its buildings, land equipment) could repay any debts.
- Gearing: Shows the long-term financial position of the business. It can show balance of funding in a business, i.e., how much money is from loans (on which it needs to pay interest) and how much is from shareholder funds (on which it needs to pay a dividend to shareholders). More money from loans carries more cost and therefore more risk.
- Profitability or performance ratios: Shows how well a business is doing. They relate to the business objectives, which might be to make profit or obtain a return on investment, or collects its debts quickly.

It is important that management accountants look at all the relevant ratios when making a decision. Management accountants need to be able to produce accurate analysis, correct forecasts and a detached and professional overview to a company’s performance. These contribute to the future success of a business.

Other tools available to a management accountant include:

- Cash flow forecasts which look at likely future flows of costs and revenues. The business uses these to plan expenditure and to see where it might need to borrow.
- Budgets, which are financial plans for the future. They help the business to see where it will incur costs and where revenues will come from. They are particularly important in helping to co-ordinate the different parts or activities of a business.
- Variances which show the difference between what was forecast to happen (in a budget) and what actually happened. The reasons for these differences can then be analysed to show why the variance occurred. Management accountants can then see how the business can build on positive variances or avoid negative ones in future.
- Investment appraisal helps to decide whether a particular investment is worthwhile or not. It looks at the costs of investing, for example, in a new factory or processes and at the likely financial returns.

1.8 Ratio Analysis

Ratio analysis is based on the fact that single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information. Ratio analysis is comparison of different numbers from the balance sheet, incoming statement and cash flow statement against the figure of previous years, other companies, the industry, or even the economy in general for the purpose of financial analysis.

To evaluate the financial performance of a company, the financial ratios are used as a very sophisticated tool. But, the type of analysis varies according to the specific interests of the party involved. Trade creditors are interested primarily in the liquidity of a firm. Their claims are short term, and the ability of a firm to pay these claims is best judged by means of a thorough analysis of its liquidity. The claims of bondholders, on the other hand, are long term. Accordingly, they are more interested in the cash-flow ability of the company to service debt over the long run. The bondholder may evaluate this ability by analyzing the capital structure of the firm, the major sources and uses of funds, its profitability over time, and projections of future profitability. Investors in a company’s common stock are concerned principally with present and expected future earnings and the stability of these earnings about a trend, as well as their covariance with the earnings of other companies.

As a result, investors might concentrate their analysis on a company’s profitability. They would be concerned with its financial condition so far as it affects the ability of the company to pay dividends and to avoid bankruptcy. In
order to bargain more effectively for outside funds, the management of a firm should be interested in all aspects of financial analysis that outside suppliers of capital use in evaluating the firm. Management also employs financial analysis for purposes of internal control. In particular, it is concerned with profitability on investment in the various assets of the company and in the efficiency of asset management.

**Precautions in using ratio analysis**
The analyst should avoid using rules of thumb indiscriminately for all industries. For example, the criterion that all companies should have at least a 2-to-1 current ratio is inappropriate. The analysis must be in relation to the type of business in which the firm is engaged and to the firm itself. The true test of liquidity is whether a company has the ability to pay its bills on time. Many sound companies, including electric utilities, have this ability despite current ratios substantially below 2 to 1. It depends on the nature of the business. Only by comparing the financial ratios of one firm with those of similar firms can one make a realistic judgment.

Similarly, analysis of the deviation from the norm should be based on some knowledge of the distribution of ratios for the companies involved. If the company being studied has a current ratio of 1.4 and the industry norm is 1.8, one would like to know the proportion of companies whose ratios are below 1.4. If it is only 2 per cent, we are likely to be much more concerned than if it is 25 per cent. Therefore, we need information on the dispersion of the distribution to judge the significance of the deviation of a financial ratio for a particular company from the industry norm.

Comparisons with the industry must be approached with caution. It may be that the financial condition and performance of the entire industry is less than satisfactory, and a company’s being above average may not be sufficient. The company may have a number of problems on an absolute basis and should not take refuge in a favourable comparison with the industry. The industry ratios should not be treated as target asset and performance norms. Rather, they provide general guidelines. For benchmark purposes, a set of firms displaying ‘best practices’ should be developed. In addition, the analyst should realise that the various companies within an industry grouping may not be homogeneous. Companies with multiple product lines often defy precise industry categorisation. They may be placed in the most ‘appropriate’ industry grouping, but comparison with other companies in that industry may not be consistent. Also, companies in an industry may differ substantially in size.

Because reported financial data and the ratios computed from these data are numerical, there is a tendency to regard them as precise portrayals of a firm’s true financial status. Accounting data such as depreciation, reserve for bad debts, and other reserves are estimates at best and may not reflect economic depreciation, bad debts, and other losses. To the extent possible, accounting data from different companies should be standardised.

**1.8.1 Types of Ratio Analysis**
The ratios can be classified into following four broad categories.

**1.8.1.1 Liquidity ratio**
Liquidity or short term solvency means ability of the business to pay its short term liabilities.
- **Current Ratios:** The current ratio is one of the best known measures of financial strength.
  \[
  \text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
  \]
- **Quick Ratios:** The quick ratio is sometimes called the “acid test” ratio and is one of the best measures of liquidity. It is a more conservative measure than current ratio.
  \[
  \text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}
  \]
- **Cash Ratio/Absolute Liquidity Ratio:** The cash ratio measures the absolute liquidity of the business. This ratio considers only the absolute liquidity available with the firm.
  \[
  \text{Cash Ratio} = \frac{\text{Cash} + \text{ Marketable Securities}}{\text{Current Liabilities}}
  \]
- **Basic Defence Interval:** This ratio helps in determining the number of days the company can cover its cash expenses without the aid of additional financing.
  \[
  \text{Basic Defence Interval} = \frac{(\text{Cash} + \text{Receivables} + \text{ Marketable Securities})}{(\text{Operating Expenses} + \text{Interest} + \text{Income Taxes})/ 365}
  \]
• Networking Capital Ratio: It helps to determine company’s ability to weather financial crises over time.

\[ \text{Net Working Capital Ratio} = \text{Current Assets} - \text{Current Liabilities} \]

(excluding short term bank borrowing)

1.8.1.2 Capital Structure/Leverage Ratios
The capital structure/leverage ratios can be defined as those financial ratios which measure the long term stability and structure of the firm.

Capital Structure Ratios: These ratios provide an insight into the financing techniques used by a business and focus, as a consequence, on a long term solvency position.

• Equity Ratios: This ratio indicates proportion of owners fund to total fund invested in the business.

\[ \text{Equity Ratio} = \frac{\text{Shareholders’ Equity}}{\text{Total Capital Employed}} \]

• Debt Ratio: This ratio is used to analyse the long-term solvency of a firm.

\[ \text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Capital Employed}} \]

• Debt to Equity Ratio: Debt equity ratio is the indicator of leverage.

\[ \text{Debt to Equity Ratio} = \frac{\text{Debt Preferred Long Term}}{\text{Shareholders’ Equity}} \]

1.8.1.3 Coverage Ratios
The coverage ratios measure the firm’s ability to service the fixed liabilities.

• Debt Service Coverage Ratio: Lenders are interested in debt service coverage to judge the firm’s ability to pay off current interest and instalments.

\[ \text{Debt Service Coverage Ratio} = \frac{\text{Earnings available for debt service}}{\text{Interest Instalments}} \]

• Interest Coverage Ratio: Also known as “times interest earned ratio” indicates the firm’s ability to meet interest (and other fixed-charges) obligations.

\[ \text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest}} \]

• Preference Dividend Coverage Ratio: This ratio measures the ability of a firm to pay dividend on preference shares which carry a stated rate of return.

\[ \text{Preference Dividend Coverage Ratio} = \frac{\text{EAT}}{\text{Preference dividend liability}} \]

• Capital Gearing Ratio: In addition to debt-equity ratio, sometimes capital gearing ratio is also calculated to show the proportion of fixed interest (dividend) bearing capital to funds belonging to equity shareholders.

\[ \text{Capital Gearing Ratio} = \frac{(\text{Preference Share Capital Debentures Long Term Loan})}{(\text{Equity Share Capital Reserves & Surplus Losses})} \]
1.8.1.4 Activity Ratios
These ratios are employed to evaluate the efficiency with which the firm manages and utilises its assets.

**Capital Turnover Ratio:**
This ratio indicates the firm’s ability of generating sales per rupee of long term investment.

\[
\text{Capital Turnover Ratio} = \frac{\text{Sales}}{\text{Capital Employed}}
\]

**Fixed Assets Turnover Ratio:**
A high fixed assets turnover ratio indicates efficient utilisation of fixed assets in generating sales.

\[
\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Capital Assets}}
\]

**Working Capital Turnover**

\[
\text{Working Capital Turnover} = \frac{\text{Sales}}{\text{Working Capital}}
\]

Working Capital Turnover is further segregated into Inventory Turnover, Debtors Turnover, and Creditors Turnover.

**Inventory Turnover Ratio:**
This ratio also known as stock turnover ratio establishes the relationship between the cost of goods sold during the year and average inventory held during the year.

\[
\text{Inventory Turnover Ratio} = \frac{\text{Sales}}{\text{Average Inventory}}
\]

\[
\text{Average Inventory} = \frac{\text{Opening Stock} + \text{Closing Stock}}{2}
\]

**Debtor’s Turnover Ratio:**
The debtor’s turnover ratio throws light on the collection and credit policies of the firm.

\[
\text{Sales} \quad \frac{\text{Average Accounts Receivable}}{}
\]

**Average Accounts Receivable Creditor’s Turnover Ratio:**
This ratio shows the velocity of debt payment by the firm. It is calculated as follows:

\[
\text{Creditors Turnover Ratio} = \frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payable}}
\]

1.8.1.5 Profitability Ratios
The profitability ratios measure the profitability or the operational efficiency of the firm. These ratios reflect the final results of business operations.

- **Return on Equity (ROE):** Return on Equity measures the profitability of equity funds invested in the firm. This ratio reveals how profitability of the owners’ funds have been utilised by the firm.

\[
\text{ROE} = \frac{\text{Profit after taxes}}{\text{Net worth}}
\]
Earnings per Share: The profitability of a firm from the point of view of ordinary shareholders can be measured in terms of number of equity shares. This is known as Earnings per share.

Earnings per share (EPS) = \frac{\text{Net profit available to equity holders}}{\text{Number of ordinary shares outstanding}}

Dividend per Share: Dividend per share ratio indicates the amount of profit distributed to shareholders per share

\text{Dividend per share} = \frac{\text{Total profits distributed to equity share holders}}{\text{Number of equity shares}}

Price Earning Ratio: The price earning ratio indicates the expectation of equity investors about the earnings of the firm. It relates earnings to market price and is generally taken as a summary measure of growth potential of an investment, risk characteristics, shareholders orientation, corporate image and degree of liquidity.

\text{PE Ratio} = \frac{\text{Market price per share}}{\text{Earnings per share}}

Return on Capital Employed/Return on Investment: It is the percentage of return on funds invested in the business by its owners.

Return on capital employed will be equal to return divided by capital employed and the complete thing will be multiplied by hundred.

\text{ROA} = \frac{\text{Net profit after taxes}}{\text{Average total assets}}

Gross Profit Ratio: This ratio is used to compare departmental profitability or product profitability. For taking out gross profit ratio we will divide gross profit by sales and the entire thing will be multiplied by hundred.

\text{Gross Profit Ratio} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100

Operating Profit Ratio: This ratio measures the profitability of the firm in terms of assets employed in the firm.

\text{Operating Profit Ratio} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100

Net Profit Ratio: It measures overall profitability of the business.

\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100

Yield: This ratio indicates return on investment; this may be on average investment or closing investment. Dividend (%) indicates return on paid up value of shares. But yield (%) is the indicator of true return in which share capital is taken at its market value.

\text{Yield} = \frac{\text{Dividend}}{\text{Average Share Price}} \times 100

Market Value/Book Value per Share: This ratio indicates market response of the shareholders’ investment.

\frac{\text{Market value per share}}{\text{Book value per share}} = \frac{\text{Average Share Price}}{\text{Number of Equity Shares}}

1.8.2 Importance of Ratio Analysis

The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm. It is relevant in assessing the performance of a firm in respect of following aspects:
Cash flow statement is a statement which discloses the changes in cash position between the two periods. Along with changes in the cash position the cash flow statement also outlines the reasons for such inflows or outflows of cash which in turn helps to analyze the functioning of a business.

Classification of Cash Flow Activities
The cash flow statement should report cash flows during the period classified into following categories:

- Operating activities: These are the principal revenue-producing activities of the enterprise and other activities that are not investing or financing activities.
- Investing activities: These activities relate to the acquisition and disposal of long-term assets and other investments not included in cash equivalents. Cash equivalents are short term highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value.
- Financing activities: These are activities that result in changes in the size and composition of the owners’ capital (including preference share capital in the case of a company) and borrowings of the enterprise.

Procedure in Preparation of Cash Flow Statement

- Calculation of net increase or decrease in cash and cash equivalents accounts: The difference between cash and cash equivalents for the period may be computed by comparing these accounts given in the comparative balance sheets. The results will be cash receipts and payments during the period responsible for the increase or decrease in cash and cash equivalent items.
- Calculation of the net cash provided or used by operating activities: It is by the analysis of Profit and Loss Account, Comparative Balance Sheet and selected additional information.
- Calculation of the net cash provided or used by investing and financing activities: All other changes in the Balance sheet items must be analysed taking into account the additional information and effect on cash may be grouped under the investing and financing activities.
- Final preparation of a cash flow statement: It may be prepared by classifying all cash inflows and outflows in terms of operating, investing and financing activities. The net cash flow provided or used in each of these three activities may be highlighted. Ensure that the aggregate of net cash flows from operating, investing and financing activities is equal to net increase or decrease in cash and cash equivalents.

Reporting of Cash Flow from Operating Activities
There are two methods of converting net profit into net cash flows from operating activities-

- Direct method: Actual cash receipts (for a period) from operating revenues and actual cash payments (for a period) for operating expenses are arranged and presented in the cash flow statement. The difference between cash receipts and cash payments is the net cash flow from operating activities.
- Indirect method: In this method the net profit (loss) is used as the base then adjusted for items that affected net profit but did not affect cash.

Funds Flow Statement
It ascertains the changes in financial position of a firm between two accounting periods. It analyses the reasons for change in financial position between two balance sheets. It shows the inflow and outflow of funds i.e., sources and application of funds during a particular period.
Sources of Funds
The sources of funds are:
• Long term fund raised by issue of shares, debentures or sale of fixed assets and
• Fund generated from operations which may be taken as a gross before payment of dividend and taxes or net after payment of dividend and taxes.

Applications of Funds
The applications of funds are:
• Investment in Fixed Assets
• Repayment of Capital

1.11 Funds Flow Statement vs. Cash Flow Statement
Following table gives the difference between funds flow statements and cash flow statements:

<table>
<thead>
<tr>
<th>Funds flow statement</th>
<th>Cash flow statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>It ascertains the changes in balance of cash in hand and bank.</td>
<td>It ascertains the changes in financial position between two accounting periods.</td>
</tr>
<tr>
<td>It analyses the reasons for changes in balance of cash in hand and bank.</td>
<td>It analyses the reasons for change in financial position between two balance sheets.</td>
</tr>
<tr>
<td>It shows the inflows and outflows of cash.</td>
<td>It reveals the sources and application of funds.</td>
</tr>
<tr>
<td>It is an important tool for short term analysis.</td>
<td>It helps to test whether working capital has been effectively used or not.</td>
</tr>
<tr>
<td>The two significant areas of analysis are cash generating efficiency and free cash flow.</td>
<td></td>
</tr>
</tbody>
</table>
Summary

- Management Accounting is the study of managerial aspect of financial accounting, “accounting in relation to management function”.
- The primary task of management accounting is, therefore, to redesign the entire accounting system so that it may serve the operational needs of the firm.
- Management is entrusted with the primary task of planning, execution and control of the operating activities of an enterprise.
- The word ‘accounting’ used in this phrase should not lead us to believe that it is restricted to a mere record of business transactions i.e., book keeping only. It has indeed a ‘macro-economic approach’.
- Applying management accounting principles to financial matters can arrive at no single perfect solution. It is, therefore, an inexact science, which uses its own conventions rather than standardised principles.
- Management accounting is concerned with presentation of accounting information in the most useful way for the management.
- Financial analysis and planning is carried out for the purpose of obtaining material and relevant information necessary for ascertaining the financial strengths and weaknesses of an enterprise and is necessary to analyse the data depicted in the financial statements.
- Ratio analysis is based on the fact that single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information.
- Liquidity or short term solvency means ability of the business to pay its short term liabilities.
- Cash flow statement is a statement which discloses the changes in cash position between the two periods.
- Fund flow statement ascertains the changes in financial position of a firm between two accounting periods.
- The importance of ratio analysis lies in the fact that it presents facts on a comparative basis and enables drawing of inferences regarding the performance of a firm.

References


Recommended Reading

Self Assessment

1. _______ is entrusted with the primary task of planning, execution and control of the operating activities of an enterprise.
   a. Management
   b. Government
   c. Organisation
   d. Public

2. _______ flow statement is a statement which discloses the changes in cash position between the two periods.
   a. Fund
   b. Cash
   c. Library
   d. Ratio

3. _______ or short term solvency means ability of the business to pay its short term liabilities.
   a. Liquidity
   b. Fund
   c. Cash
   d. Yield

4. The _______ earning ratio indicates the expectation of equity investors about the earnings of the firm.
   a. cash
   b. fund
   c. price
   d. ratio

5. Cash flow statements ascertain the changes in ________ position between two accounting periods.
   a. commercial
   b. financial
   c. management
   d. organisational

6. Which of the following statements is true?
   a. Liquidity or long term solvency means ability of the business to pay its short term liabilities.
   b. Management is not entrusted with the primary task of planning, execution and control of the operating activities of an enterprise.
   c. Fund flow statement is an important tool for long term analysis.
   d. Cash flow statement is a statement which discloses the changes in cash position between the two periods.

7. Which of the following statements is false?
   a. Management Accounting is the study of managerial aspect of financial accounting, “accounting in relation to management function”.
   b. Fund flow statement ascertains the changes in financial position of a firm between two accounting periods.
   c. Cash flow statement analyses the reasons for changes in balance of cash in hand and bank.
   d. The capital structure/leverage ratios can be defined as those financial ratios which measure the long term stability and structure of the firm.
8. _________ ratio also known as stock turnover ratio establishes the relationship between the cost of goods sold during the year and average inventory held during the year.
   a. Debtor’s turnover
   b. Capital turnover
   c. Working turnover
   d. Inventory turnover

9. _________ ratio is used to compare departmental profitability or product profitability.
   a. Gross
   b. Operational
   c. ROA
   d. Net profit

10. The _________ task of management accounting is, therefore, to redesign the entire accounting system so that it may serve the operational needs of the firm.
    a. primary
    b. secondary
    c. operational
    d. inventory
Chapter II
Cost Accounting

Aim

The aim of this chapter is to:

- explicate the concept of cost accounting
- explain the importance of accounting
- elucidate the need for cost accounting

Objectives

The objectives of this chapter are to:

- examine the evolution of cost sheet
- analyse the process of accounting
- enlist the benefits of cost accounting

Learning outcome

At the end of this chapter, you will be able to:

- define elements of cost
- understand the importance of cost accounting
- identify the various techniques of costing
2.1 Introduction

Cost Accounting is one of the important disciplines of accountancy to give proper information required to the management for effectively discharging its functions such as planning, organising, controlling, directing, coordinating and decision making. In this regard Financial Accounting is concerned with record keeping directed towards the preparation of Profit and Loss Account and Balance Sheet. It provides information about the enterprise in a general way. Accordingly Financial Accounts are prepared as per the requirement of the Companies Act and Income Tax Act. The main purpose of financial accounting is to ascertain profit or loss of a concern as a whole for a particular period.

Thus, financial accounting does not serve as the needs of management for effective control, determination of prices, making effective plan for future operations and formulating various policy decisions. To overcome the limitations of the financial accounting, the cost accounting is a recent development born in response to the needs of management for detailed information about cost of a product or a unit of services. Every business firm is expected to make profit in the long run and, keep costs within control. Recently the Companies Act has made obligatory the keeping of cost records in some manufacturing companies. In essence, therefore Cost Accounting is now widely used by large manufacturing and nonmanufacturing operations.

A method of accounting in which all costs incurred in carrying out an activity or accomplishing a purpose are collected, classified, and recorded. This data is then summarised and analyzed to arrive at a selling price, or to determine where savings are possible.

In contrast to financial accounting (which considers money as the measure of economic performance) cost accounting considers money as the economic factor of production.

2.2 Cost Accounting

The term ‘methods’ and ‘systems’ are used synonymously to indicate an integrated set of procedures based on a complex concept of ideas, principles and concepts. The term method of costing refers to cost ascertainment. Different methods of costing for different industries depend upon the production activities and the nature of business. For these, costing methods can be grouped into two broad categories:

- Job costing
- Process costing

**Job Costing**

Job costing is also termed as Specific Order Costing (or) Terminal Costing. In job costing, costs are collected and accumulated according to jobs, contracts, products or work orders. Each job is treated as a separate entity for the purpose of costing. The material and labour costs are complied through the respective abstracts and overheads are charged on predetermined basis to arrive at the total cost. Job costing is used in printing, furniture making, ship building, etc. Job costing is further classified into

- Contract costing
- Cost plus contract
- Batch costing

**Contract costing**

This method of costing is applicable where the job work is big like contract work of building. Under this method, costs are collected according to each contract work. Contract costing is also termed as Terminal Costing. The principles of job costing are applied in contract costing.

**Cost plus contract**

These contracts provide for the payment by the contracted of the actual cost of manufacture plus a stipulated profit. The profit to be added to the cost. It may be a fixed amount or it may be a stipulated percentage of cost. These contracts are generally entered into when at the time of undertaking of a work, it is not possible to estimate its cost
with reasonable accuracy due to unstable condition of material, labour, etc., or when the work is spread over a long period of time and prices of materials, rates of labour, etc., are liable to fluctuate.

**Batch costing**

In Batch Costing, a lot of similar units which comprise the batch may be used as a cost unit for ascertainment of cost. Separate Cost Sheet is maintained for each batch by assigning a batch number. Cost per unit of product is determined by dividing the total cost of a batch by the number of units of the batch. Batch Costing is used in drug industries, ready-made garments industries, electronic components manufacturing, T V Sets, etc.

**Process costing**

This costing method refers to continuous operation or continuous process costing. Process costing method is applicable where goods or services pass through different processes to be converted into finished goods. Process costing is used in Cement industries, Sugar industries, Textiles, Chemical industries etc. The following are the important variants of process costing system:

- Operation costing: It is concerned with the determination of the cost of each operation rather than process. It offers scope for computation of unit operation cost at the end of each operation by dividing the total operation cost by total output of units.
- Operating costing: Operating costing is also termed as service costing. Operating costing is similar to process costing and is used in service industries. This method of costing is suitable for concerns rendering services. For example, hospitals, transport, canteen, hotels, etc.
- Output costing: Output costing is also called Unit Costing (or) Single Costing. This method of costing is applicable where a concern undertakes mass and continuous production of single unit or two or three types of similar products or different grades of the same products. Under this method cost per unit is measured by dividing the total cost by number of units produced. Output Costing is used in industries like cement, cigarettes, pencils, quarries etc.
- Multiple costing: This method of costing means combination of two or more methods of costing like operation costing and output costing. Under this method the cost of different sections of production are combined after finding out the cost of each and every part manufactured. This method of costing is suitable for the industries manufacturing motor cars, engines, aircraft, tractors, etc.

### 2.3 Techniques of Costing

Costing is the technique and process useful to allocation of expenditure, cost ascertainment and cost control. In order to fulfil the needs of the management it supplies necessary information to the management. The following are the various techniques of costing:

- Uniform costing
- Marginal costing
- Standard costing
- Historical costing
- Absorption costing

**Uniform costing**

Uniform costing is not a distinct method of costing. In fact when several undertakings start using the same costing principles and/or practices, they are said to be following uniform costing. The basic idea behind uniform costing is that the different firms in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good.

**Marginal costing**

The C. I. M. A. London defines Marginal costing as “a technique of costing which aims at ascertaining marginal costs, determining the effects of changes in costs, volume, price etc. on the Company’s profitability, stability etc. and furnishing the relevant data to the management for enabling it to take various management decisions by segregating total costs into variable and fixed costs.”
**Standard costing**
Standard costing is a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation, so that any remedial action may be taken immediately.

**Historical costing**
Historical costing is the ascertainment and recording of actual costs when, or after, they have been incurred and was one of the first stages in the growth of the Cost Accountant’s work. Actual costs refer to material cost, labour cost and overhead cost.

**Absorption costing**
Absorption costing is also termed as Full Costing (or) Orthodox Costing. It is the technique that takes into account charging of all costs both variable and fixed costs to operational processed or products or services.

### 2.4 Classification of Cost
Classification is the process of grouping costs according to their common characteristics or features. There are various methods of classifying costs on the basis of requirements. The following are the important bases on which costs are classified:

- On the basis of Nature (or) Elements.
- On the basis of Function
- On the basis of Variability
- On the basis of Normality
- On the basis of Controllability and Decision Making.

**On the basis of nature or elements**
One of the important classification cost is on the basis of nature or elements. Based on elements, it is classified into Material Cost, Labour Cost and Other Expenses. They can be further subdivided into Direct and Indirect Material Cost, Direct and Indirect Labour Cost and Direct and Indirect Other Expenses.

**On the basis of function**
The classification of costs on the basis of the various function of a concern is known as function-wise classification. Here there are four important functional divisions in the business organisation, viz.:

- Production Cost
- Administration Cost
- Selling Cost and
- Distribution Cost

**On the basis of variability**
On the basis of variability with the volume of production Cost is classified into Fixed Cost, Variable Cost and Semi Variable Cost; Fixed Costs are those costs incurred which remain constant with the volume of production. Rent and rates of office and factory buildings are examples of fixed cost. Variable costs are those costs incurred directly with the volume of output. For example, cost of materials and wages to workers are the expenses chargeable with direct proportion to the volume of production. Semi-Variable Costs are those costs incurred, partly fixed and partly variable, with the volume of production. Accordingly, it has both fixed and variable features. For example, depreciations and maintenance cost of plant and machinery.

**On the basis of normality**
Costs are classified into normal costs and abnormal costs on the basis of normality features. Normal costs are those incurred normally within the target output or fixed plan.
On the basis of controllability and decision making
Based on the managerial decision making and controllability the classifications are as follows:

- Controllable cost
- Uncontrollable cost
- Sunk cost
- Opportunity cost
- Replacement cost
- Conversion cost

Controllable costs
Controllable Costs are the costs which can be influenced by the action of a specified number of an undertaking. Controllable Costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre. For example, direct materials and indirect materials.

Uncontrollable costs
Uncontrollable Costs are those costs which cannot be influenced by the action of a specified number of an undertaking. In fact, no cost is controllable; it is only in relation to a particular individual that may specify a particular cost to either controllable or non-controllable. For example, rent and rates.

Sunk cost
These are historical costs which were incurred in the past and are not relevant to the particular decision making problem being considered. While considering the replacement of a plant, the depreciated book-value of the old asset is irrelevant as the amount is a sunk cost which is to be written-off at the time of replacement. Unlike incremental or decremental costs, sunk costs are not affected by increase or decrease of volume. Examples of sunk cost include dedicated fixed assets, development cost already incurred.

Opportunity cost
Opportunity costs mean the costs of foregoing or giving up an opportunity. It is the notional value of going without the next best use of time, effort and money. These indicate the income or potential benefits sacrificed because a certain course of action has been taken. An example of opportunity costs is the market value forgone or sacrificed when an old machine is being used.

Replacement cost
Such expenses may be incurred due to factors like change in method of production, an addition or alteration in the factory building, change in flow of production etc. All such expenses are treated as production overheads; when amount of such expenses is large, it may be spread over a period of time.

Conversion cost
Conversion Costs are those costs incurred while converting materials into semi-finished or finished goods. It is the aggregate of direct wages, direct expenses and overhead costs of converting raw materials into finished products.

2.5 Elements of Cost
Elements of cost are necessary to have a proper classification and analysis of total cost. Thus, elements of cost provide the management with necessary information for proper control and management decisions. For this purpose, the total cost is analysed by the elements or nature of cost, i.e., material, labour and overheads. The various elements of costs may be illustrated as below:
**Cost and Management Accounting**

**Elements of Cost**

- **Materials**
  - Direct
  - Indirect
- **Labour**
  - Direct
  - Indirect
- **Other Expenses**
  - Direct
  - Indirect

**Overheads**

- **Production or Factory Overhead**
- **Administration Overhead**
- **Selling Overhead**
- **Distribution Overhead**

**Fig. 2.1 Elements of cost accounting**

(Source: http://www.cbse.nic.in/curric~1/qp2010/12/ELEMENTS%20OF%20COST%20ACCOUNTING%20AND%20AUDITING.pdf)

**Materials costs**

Refers to cost of materials which are the major substances used in production and are converted into finished goods and semi-finished goods. Materials are grouped as direct materials and indirect materials.

- **Direct Materials**: Direct materials are those that form part of a product. Raw materials, semi-finished products, and finished products which can be identified with production of a product are known as direct materials. Sugar cane, cotton, oilseeds, woods etc. are examples of direct materials. The cost of materials involves conversion of raw materials into finished products.

- **Indirect Materials**: Material costs, other than direct material cost are known as indirect material cost. Indirect materials cannot be identified with a particular unit of cost or product. Indirect materials are indirectly used for producing the products. Lubricating oil, consumable stores, fuel, design, layout etc. are examples of indirect material cost.

**Labour cost**

In actual production of the product, labour is the prime factor which is physically and mentally involved. The payment of remuneration of wages is made for their effort. The labour costs are grouped into direct labour and indirect labour.

- **Direct labour**: Direct labour cost or direct wages refer to those specifically incurred for or can be readily charged to or identified with a specific job, contract, work order or any other unit of cost are termed as direct labour cost. Wages for supervision, wages for foremen, and wages for labours who are actually engaged in operation or process are examples of direct labour cost.

- **Indirect labour**: Indirect labour is for work in general. The importance of the distinction lies in the fact that whereas direct labour can be identified with and charged to the job, indirect labour cannot be so charged and has therefore to be treated as part of the factory overheads to be included in the cost of production. Examples are salaries and wages of supervisors, store keepers, maintenance labour etc.

**Expenses**

All expenses are other than material and labour that are incurred for a particular product or process. They are defined by ICMA as “The cost of service provided to an undertaking and the notional cost of the use of owned assets.” Expenses are further grouped into direct expenses and indirect expenses.
• Direct Expenses: Direct expenses which are incurred directly and identified with a unit of output or process are treated as direct expenses. Hire charges of special plant or tool, royalty on product, cost of special pattern etc. are the examples of direct expenses.

• Indirect Expenses: Indirect expenses are expenses other than indirect materials and indirect labour, which cannot be directly identified with a unit of output. Rent, power, lighting, repairs, telephone etc. are examples of indirect expenses.

### 2.6 Overheads

All indirect material cost, indirect labour cost, and indirect expenses are termed as Overheads. Overheads may also be classified into

- Production or factory overhead
- Office and administrative overheads
- Selling overhead
- Distribution overhead

**Production overhead**

Production Overhead is also termed as Factory Overhead. Factory overhead includes indirect material, indirect labour and indirect wages which are incurred in the factory. For example, rent of factory building, repairs, depreciation, wages of indirect workers, etc.

**Office and administrative overhead**

Office and Administrative Overhead is the indirect expenditure incurred in formulating the policies, establishment of objectives, planning, organising and controlling the operations of an undertaking. All office and administrative expenses like rent, staff salaries, postage, telegram, general expenses etc. are examples.

**Selling overhead**

Selling Overhead is the indirect expenses which are incurred for promoting sales, stimulating demand, securing orders and retaining customers. For example, advertisement, salesmen’s commission, salaries of salesmen etc.

**Distribution overhead**

These costs are incurred from the time the product is packed until it reaches its destination. Cost of warehousing, cost of packing, transportation cost etc. are some of the examples of distribution overhead.

### 2.7 Objectives of Cost Accounting

The main objectives of cost accounting can be summarised as follows:

**Ascertaining costs**

The first and foremost objective of cost accounting is to find out cost of a product, process or service. The other objectives which have been mentioned hereafter can be achieved only when the costs have been ascertained.

**Determining selling price**

Business enterprises are run on a profit – making basis. It is thus necessary that the revenue should be greater than the costs incurred in producing goods and services from which the revenue is to be derived. Cost accounting provides information regarding the cost to make and sell such products or services.

**Measuring and increasing efficiency**

Cost accounting involves a study of the various operations used in manufacturing a product or providing services. The study facilitates measuring of the efficiency of the organisation as a whole as well as of the departments besides devising means of increasing the efficiency.
Cost control and cost reduction
Cost accounting assists in controlling costs. Budgets are prepared in advance. The standards for each item of cost are determined, the actual costs are compared with the standard costs and variances are found out as to their causes. This greatly increases the operating efficiency of the enterprise. Besides it, cost is required to be reduced also constant research and development activities help in reduction of costs without compromising with the quality of goods or services.

Cost management
The term ‘Cost Management’ includes the activities of managers in short-run and long-run planning and control of costs. Cost management has a broad focus. It includes both cost control and cost reduction. As a matter of fact cost management is often invariably linked with revenue and profit planning. For instance, to enhance revenue and profits, the management often deliberately incurs additional costs for advertising and product modifications.

Ascertaining profits
Cost accounting also aims at ascertaining the profits of each and every activity. It produces statements at such intervals as the management may require. The financial statements prepared under financial accounting, generally once a year or half – year, are spaced too far apart in time to meet the needs of the management. In order to operate the business at a high level of efficiency, it is essential for the management to have a frequent review of production, sales and operating results. Cost accounting provides daily, weekly or monthly volumes of units produced, accumulated costs together with appropriate analysis so that quantum of profit and profitability is known.

Providing basis for managerial decision – making
Costs accounting helps the management in formulation operative policies. These policies may relate to any of the following matters:

- Determination of cost, volume, profit relationship
- Shutting down or operating at a loss
- Making or buying from outside supplies
- Continuing with the existing plant and machinery or replacing them by improved and economical means

2.8 Importance of Cost Accounting
Following are some points which show the importance of cost accounting:

- Costing helps in periods of trade depression and trade competition: In periods of trade depression the business cannot afford to have leakages which pass unchecked. The management should know where economies may be sought, waste eliminated and efficiency increased. The business has to wage a war for its survival. The management should know the actual cost of their products before embarking on any scheme of reducing the prices on giving tenders. Adequate costing facilitates this.
- Aids in price fixation: Though economic law & supply and demand and activities of the competitors, to a great extent, determine the price of the article, cost to the producer does play an important part. The producer can take necessary guidance from his costing records.
- Helps in estimate: Adequate costing records provide a reliable basis upon which tenders and estimates may be prepared. The chances of losing a contract on account of over – rating or losing in the execution of a contract due to under – rating can be minimised. Thus, “ascertained costs provide a measure for estimates, a guide to policy, and a control over current production”.
- Helps in channelling production on right lines: Costing makes possible for the management to distinguish between profitable and non-profitable activities profit can be maximised by concentrating on profitable operations and eliminating non-profitable ones.
- Wastages are eliminated: As it is possible to know the cost of the article at every stage, it becomes possible to chock various forms of waste, such as time, expenses etc. or in the use of machine, equipment and tools.
- Costing makes comparison possible: If the costing records are regularly kept, comparative cost data for different periods and various volumes of production will be available. It will help the management in forming future lines of action.
• Provides data for periodical profit and loss accounts: Adequate costing records supply to the management such data as may be necessary for preparation of profit and loss account and balance sheet, at such intervals as may be desired by the management. It also explains in detail the sources of profit or loss revealed by the financial accounts thus helps in presentation of better information before the management.

• Aids in determining and enhancing efficiency: Losses due to wastage of material, idle time of workers, poor supervision etc., will be disclosed if the various operations involved in manufacturing a product are studied by a cost accountant. The efficiency can be measured and costs controlled and through its various devices can be framed to increase the efficiency.

• Helps in inventory control: Costing furnishes control which management requires in respect of stock of materials, work-in-progress and finished goods. (This has been explained in detail under the chapter “Materials”)

• Helps in cost reduction: Costs can be reduced in the long run when alternatives are tried. This is particularly important in the present day context of global competition cost accounting has assumed special significance beyond cost control this way.

• Assists in increasing productivity: Productivity of material and labour is required to be increased to have growth and more profitability in the organisation costing renders great assistance in measuring productivity and suggesting ways to improve it.

2.9 Characteristics of an Ideal Costing System

An ideal system of costing is that which achieves the objectives of a costing system and brings all advantages of costing to the business. The following are the main characteristics which an ideal system of costing should possess or the points which should be taken into consideration before installing a costing system.

• Suitability to the business: A costing system must be devised according to the nature, conditions, requirements and size of the business. Any system which serves the purposes of the business and supplies necessary information for running the business efficiently in an ideal system.

• Simplicity: The system of costing should be simple and plain so that it may be easily understood even by a person of average intelligence. The facts, figures and other information provided by cost accounting must be prescribed in the right time to the right person in order to make it more meaningful.

• Flexibility: A costing system must be flexible so that it may be changed according to changed conditions and circumstances. The system without such flexibility will be outmoded because of fast changes in business and industry. Thus, the system must have the capacity of expansion or contraction without much change.

• Economical: A costing system is like other economic goods. It costs money just like economic goods. If the system is too expensive, management may be unwilling to pay as buyers are not willing to pay for the goods if these are expensive as compared to their utility. A costing should not be expensive and must be adopted according to the financial capacity of the business.

• Comparability: The costing system must be such so that it may provide facts and figures necessary to management for evaluating the performance by comparing with the past figures, or figures of other concerns or against the industry as a whole or other department of the same concern.

• Capability of presenting information at the desired time: The system must provide accurate and timely information so that it may be helpful to management for taking decisions and suitable action for the purpose of cost control.

• Uniformity of forms: All forms and proformas etc. necessary to the system should be uniform in size and quality of paper. Higher efficiency can be obtained by using colour of the paper to distinguish different forms.

• Efficient system of material control: There should be an efficient system of stores and stock control as materials usually account for the greater proportion of the total cost. A good method of pricing material issued to production should be followed.
### 2.10 Financial Accounting v/s Cost Accounting

Following table illustrates the difference between financial accounting and cost accounting:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Financial Accounting</th>
<th>Cost Accounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience</td>
<td>Financial accounting involves the preparation of a standard set of reports for an outside audience, which may include investors, creditors, credit rating agencies, and regulatory agencies.</td>
<td>Cost accounting involves the preparation of a broad range of reports that management needs to run a business.</td>
</tr>
<tr>
<td>Format</td>
<td>The reports prepared under financial accounting are highly specific in their format and content, as mandated by either generally accepted accounting principles or international financial reporting standards.</td>
<td>Cost accounting involves creating reports that can be in any format specified by management, with the intention of including only that information pertinent to a specific decision or situation.</td>
</tr>
<tr>
<td>Level of Detail</td>
<td>Financial accounting primarily focuses on reporting the results and financial position of an entire business entity.</td>
<td>Cost accounting usually results in reports at a much higher level of detail within the company, such as for individual products, product lines, geographical areas, customers, or subsidiaries.</td>
</tr>
<tr>
<td>Product Cost</td>
<td>Financial accounting incorporates this information into its financial reports (primarily into the balance sheet).</td>
<td>Cost accounting compiles the cost of raw materials, work-in-process, and finished goods inventory.</td>
</tr>
<tr>
<td>Regulatory framework</td>
<td>The structure of financial accounting reports are tightly governed by either generally accepted accounting principles or international financial reporting standards.</td>
<td>There is no regulatory framework governing cost accounting reports.</td>
</tr>
<tr>
<td>Report content</td>
<td>A financial report contains an aggregation of the financial information recorded through the accounting system.</td>
<td>The information in a cost accounting report can contain both financial information and operational information. The operational information comes from a variety of sources that are not under the direct control of the accounting department.</td>
</tr>
<tr>
<td>Report timing</td>
<td>Financial accounting personnel issue reports only at the end of a reporting period.</td>
<td>Cost accounting staff may issue reports at any time and with any degree of frequency, depending upon management’s need for the information.</td>
</tr>
<tr>
<td>Time horizon</td>
<td>Financial accounting is only concerned with reporting the results of reporting periods that have already been completed.</td>
<td>Cost accounting does this too, but also can be involved in a variety of projections for future periods.</td>
</tr>
</tbody>
</table>

### 2.11 Components of Total Cost

Following are the components of total cost:

#### Prime cost
It consists of costs of direct material, direct labour and direct expenses. It is also known as basic, first or flat cost.

#### Factory cost
It comprises of prime cost and in addition works of factory overheads which include costs of indirect material, indirect labour and indirect expenses of the factory. The cost is also known as works cost, production or manufacturing cost.
Office cost
If office and administrative overheads are added to factory cost office cost is arrived at this is also termed as administrative cost or the total cost of production.

Total cost
Office cost or total cost of production selling and distribution overheads are added to the total cost of production to get the total cost or the cost of sales. Cost of sales or total cost.

- Direct material + Direct labour + Direct expenses = Prime cost or Direct cost or First cost
- Prime cost + Overhead cost = Works cost or factory or production cost or manufacturing cost
- Work cost + office and Administrative overheads = Works cost or factory or production cost or manufacturing cost
- Office cost + selling and distribution overheads = Works cost or factory or production cost or manufacturing cost

2.12 Cost Sheet
Cost sheet is a document that reflects the cost of the items and services required by a particular project or department for the performance of its business purposes. For example, a departmental cost sheet might include the material costs, labour costs and overhead costs incurred over a given time frame by a department and it therefore provides a record of costs that are chargeable to that department.

Cost Sheet or a Cost Statement is “a document which provides for the assembly of the estimated detailed elements of cost in respect of cost centre or a cost unit.” The analysis for the different elements of cost of the product is shown in the form of a statement called “Cost Sheet.” The statement summarises the cost of manufacturing a particular list of product and discloses for a particular period.

- Prime cost
- Works cost (or) factory cost;
- Cost of production
- Total Cost or Cost of Sales.

Importance of cost sheet
- It provides for the presentation of the total cost on the basis of the logical classification.
- Cost sheet helps in determination of cost per unit and total cost at different stages of production. Assists enables in fixing of selling price.
- It facilitates effective cost control and cost comparison.
- It discloses operational efficiency and inefficiency to the management for taking corrective actions.
- Enables the management in the particulars preparation of cost estimates to tenders and quotations.

Illustration 1.
Calculate prime cost from the following information:-

Opening stock of raw material = Rs. 12,500
Purchased raw material = Rs. 75,000
Expenses incurred on raw material = Rs. 5,000
Closing stock of raw material = Rs. 22,500
Wages Rs. 47,600 Direct expenses = Rs. 23,400
Solution: - Calculation of raw material consumed:-
Raw material consumed = Opening stock of material + purchases of Raw material + expenses incurred on raw material - closing stock of raw material
= Rs 12,500 + Rs 75,000 + Rs 5,000 – Rs 22,500
= Rs. 92,500 – Rs 22,500
= Rs. 70,000

Prime cost = Raw material consumed + Direct labour + Direct expenses
= Rs 70,000 + Rs 47,600 + Rs 23,400
= Rs 1,41,000

Or

It can be shown in vertical form such as cost sheet

<table>
<thead>
<tr>
<th>Particular</th>
<th>Details (Rs)</th>
<th>Amount (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening stock of raw material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add:- Purchase</td>
<td>12,500</td>
<td></td>
</tr>
<tr>
<td>Add:- Expenses incurred on purchases</td>
<td>7,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>Raw material available</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Less :- closing stock of raw material</td>
<td>92,500</td>
<td></td>
</tr>
<tr>
<td>Raw material consumed</td>
<td>22,500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Add:- Direct wages or labour</td>
<td>70,000</td>
<td></td>
</tr>
<tr>
<td>Add:- Direct expenses</td>
<td>47,600</td>
<td></td>
</tr>
<tr>
<td>Prime cost</td>
<td>23,400</td>
<td>1,41,000</td>
</tr>
<tr>
<td></td>
<td>--------------</td>
<td></td>
</tr>
</tbody>
</table>
Summary

- Cost Accounting is one of the important disciplines of accountancy to give proper information required to the management for effectively discharging its functions such as planning, organising, controlling, directing, coordinating and decision making.
- The term ‘methods’ and ‘systems’ are used synonymously to indicate an integrated set of procedures based on a complex concept of ideas, principles and concepts.
- Process costing method is applicable where goods or services pass through different processes to be converted into finished goods.
- Production Overhead is also termed as Factory Overhead.
- The term ‘Cost Management’ includes the activities of managers in short-run and long-run planning and control of costs.
- Cost Sheet or a Cost Statement is “a document which provides for the assembly of the estimated detailed elements of cost in respect of cost centre or a cost unit.”
- Financial accounting primarily focuses on reporting the results and financial position of an entire business entity.
- An ideal system of costing is that which achieves the objectives of a costing system and brings all advantages of costing to the business.
- Elements of cost are necessary to have a proper classification and analysis of total cost.
- The first and foremost objective of cost accounting is to find out cost of a product, process or service.
- Selling Overhead is the indirect expenses which are incurred for promoting sales, stimulating demand, securing orders and retaining customers.
- Job costing is also termed as Specific Order Costing (or) Terminal Costing. In job costing, costs are collected and accumulated according to jobs, contracts, products or work orders.
- Financial accounting is only concerned with reporting the results of reporting periods that have already been completed.
- The information in a cost accounting report can contain both financial information and operational information.
- Opportunity costs mean the costs off or going or giving up an opportunity. It is the notional value of going without the next best use of time, effort and money.
- Cost accounting involves the preparation of a broad range of reports that management needs to run a business.
- Direct labour cost or direct wages refer to those specifically incurred for or can be readily charged to or identified with a specific job, contract, work order or any other unit of cost are termed as direct labour cost.
- There is no regulatory framework governing cost accounting reports.
- The analysis for the different elements of cost of the product is shown in the form of a statement called Cost Sheet.

References

Cost and Management Accounting


**Recommended Reading**

Self Assessment

1. ________ accounting primarily focuses on reporting the results and financial position of an entire business entity.
   a. Cost
   b. Management
   c. Financial
   d. Direct

2. ________ overhead is the indirect expenses which are incurred for promoting sales, stimulating demand, securing orders and retaining customers.
   a. Selling
   b. Administrative
   c. Office
   d. Distributive

3. The ________ in a cost accounting report can contain both financial information and operational information.
   a. data
   b. information
   c. process
   d. labour

4. The analysis for the different elements of cost of the product is shown in the form of a statement called ________.
   a. data sheet
   b. information sheet
   c. labour sheet
   d. cost Sheet

5. ________ of cost are necessary to have a proper classification and analysis of total cost.
   a. Elements
   b. Data
   c. Financial
   d. Management

6. A ________ should not be expensive and must be adopted according to the financial capacity of the business.
   a. data
   b. wages
   c. accounts
   d. costing

7. Which of the following statements is true?
   a. Cost accounting is only concerned with reporting the results of reporting periods that have already been completed.
   b. There is no regulatory framework governing financial accounting reports.
   c. Financial accounting involves the preparation of a broad range of reports that management needs to run a business.
   d. Selling overhead is the indirect expenses which are incurred for promoting sales, stimulating demand, securing orders and retaining customers.
8. Which of the following statements is false?
   a. The analysis for the different elements of cost of the product is shown in the form of a statement called information sheet.
   b. The first and foremost objective of cost accounting is to find out cost of a product, process or service.
   c. The analysis for the different elements of cost of the product is shown in the form of a statement called Cost Sheet.
   d. Process costing method is applicable where goods or services pass through different processes to be converted into finished goods.

9. ________ overhead includes indirect material, indirect labour and indirect wages which are incurred in the factory.
   a. Factory
   b. Selling
   c. Administrative
   d. Distributive

10. In ________ costing, costs are collected and accumulated according to jobs, contracts, products or work orders.
    a. process
    b. job
    c. financial
    d. product
Chapter III

Cost Concept

Aim

The aim of this chapter is to:

- explicate the concept of cost concept
- explain the importance of marginal costing
- elucidate the need for cost concept

Objectives

The objectives of this chapter are to:

- examine the evolution of cost concept
- analyse the process of activity based costing
- enlist the benefits of cost concept

Learning outcome

At the end of this chapter, you will be able to:

- define elements of cost
- understand the importance of absorption costing
- identify the various techniques of costing
3.1 Introduction

The term ‘cost’ does not have a definite meaning and its scope is extremely broad and general. It is, therefore, not easy to define or explain this term without leaving any doubt concerning its meaning. Cost accountants, economists and others develop the concept of cost according to their needs because one complete description of ‘cost’ to suit all situations is not possible.

Consequences of cost concept

The impact of using Cost Concept is as follows:-

- The assets are valued at cost or book value or at the cost derived amounts
- Items which have no cost are ignored, that is, if the business entity does not pay anything for an asset, it would appear in the books of account. The goodwill would appear in the accounts only when the enterprise has purchased the intangible asset for a price.
- Unrealised gains, i.e., gains on unsold assets are to be ignored
- The real value of the capital employed is not available in the Balance Sheet

Justification of cost concept

The justification for the cost concept lies in the following arguments:

- The acquisition cost is highly objective because it is derived from an independent transaction between two parties i.e. the business entity and the vendor
- The details of the original transaction can be easily verified from the documents that are exchanged at the time of purchase such as purchase invoice, title of ownership, property deed, and check books and so on.
- When the assets are to be recorded at market value, difficulties may arise regarding which value of which market to be taken into account.
- The going concern assumes that the business entity will continue its activities indefinitely and thus eliminate the necessity of using current values or liquidation values of asset valuation.

Limitations of cost concept

The limitations or drawbacks of this principle are as follows:-

- The items which do not have any cost are ignored. Thus the knowledge and technical skill built inside the enterprise, a favourable location, brand name and reputation of the business as time goes would find no place in the assets of the business entity.
- The money-measurement assumption which assumes that purchasing power of rupee is stable is a major limitation of the cost concept.
- The actual information needed by the management, investors, creditors, etc., may be current values of assets therefore values based upon historical cost may not be useful for their purposes.

3.2 Absorption Costing

Absorption costing is a method whereby you apply part of your fixed overhead costs to the cost of manufacturing products. You do this on a per-unit basis. Simply divide your fixed costs by the number of units you manufactured and sold during the period. The result is a cost per unit for each unit you made and sold.

3.2.1 Advantages of Absorption Costing

Absorption costing offers an advantage when you do not sell all of your manufactured products during the accounting period. You may have finished goods in inventory. Because you assign a per-unit amount for fixed expenses, each product in inventory has a value that includes part of the fixed overhead. You do not show the expense until you actually sell the items in inventory. This can improve your profits for the period.
3.2.2 Disadvantages of Absorption Costing
Absorption costing can artificially inflate your profit figures in any given accounting period. Because you will not deduct your entire fixed overhead if you haven’t sold all of your manufactured products, your profit-and-loss statement does not show the full expenses you had for the period. This can mislead you when you are analyzing your profitability.

3.3 Variable Costing
Variable costing uses fixed overhead as a lump sum, rather than a per-unit, expense. Under this method, you include all your variable costs such as supplies, raw materials and shipping. You add the full cost of fixed overhead for the period. You do not figure these expenses on a per-unit basis. Instead you subtract them from your revenue figure as a lump-sum expense.

3.3.1 Advantages of Variable Costing
Variable costing shows your profits after all the bills have been paid for the accounting period. Though you may not have received revenues for the products you manufactured because some could be in inventory, you show that you have paid all of your expenses for the period. When you finally sell the finished products in inventory, you have surplus income.

3.3.2 Disadvantages of Variable Costing
Variable costing shows full payment for fixed-overhead expenses for the accounting period. Even if you don’t sell all the products you make, you must deduct the full cost of fixed overhead. This means you show less profit for the period because you show your complete overhead expense even when you haven’t sold all of your products. You show reduced income because of unsold products but full expenses for overhead.

3.4 Activity-Based Costing
Activity-Based Costing (ABC) is that costing in which costs begin with tracing of activities and then to producing the product. In other words, it is the process of costing system which focuses on activities performed to produce products. This system assumes that activities are responsible for the incurrence of costs and products create the demand for activities. Costs are charged to products based on individual product’s use of each activity.

ABC aims at identifying as many costs as possible to be subsequently accounted as direct cost of production. Any cost that is traced to a particular product via its consumption of activity becomes direct of the product. For instance, in conventional costing system, cost of setup and adjustment time is considered as factory overhead and subsequently assigned to different products on the basis of direct labour hours. But in Activity-Based Costing, setup and adjustment time is determined for each product and its costs are directly charged to each product. Thus by emphasizing activities, ABC tries to ascertain the factors that cause each major activity, cost of such activities and the relationship between activities and products produced.

According to professor Vipul “Activity-Based Costing had its genesis in the increasing importance of indirect costs in the manufacturing operations. The direct processing costs which are easier to handle are being relegated to the background with each passing day due to automation. In this changing scenario where indirect costs far outweigh the direct processing costs in many a situation, one cannot be content with rough and ready methods of yester years in dealing with indirect costs.”

3.4.1 Different Stages in Activity-Based Costing
There are different activities in ABC costing. The following are the important stages of Activity Based Costing:
• Identify the different activities within the organisation.
• Relate the overhead cost to the activities.
• Support activities are then spread across the primary activities.
• Determine the activity cost drivers.
• Calculate the activity cost drivers rate, i.e., the quantity of cost driver used by each product.
3.4.2 ABC and Cost Drivers
In Activity-Based Costing, activities are identified and classified into different categories that have relationship with the different stages or parts of the production process. The factors that influence the cost of a particular activity are known as “Cost Drivers.” A Cost Driver is literally the factors, forces or events that determine the cost of activities. The process of activity-based costing is based on the assumption that cost behaviour is influenced by cost drives. It should be understood that direct costs do not need cost drivers because direct costs are themselves cost drivers. They can be traced by direct relationship with the different parts of product. However, all other factory, office and administrative overheads need cost drives.

3.4.3 Classification of Activities
In the first stage of the Activity-Based Costing activities are identified and classified into different categories or segments of the production process. The grouping of activities is preferably done using the different levels at which activities are performed. Broadly, activities are classified into:

- Unit Level Activities
- Batch Level Activities
- Product Level Activities
- Facility Level Activities

**Unit Level Activities**
Unit Level Activities are those activities which are performed each time a single product or unit is produced. These activities are repetitive in nature. For example, direct labour hours, machine hours, powers etc. are the activities used for each time for producing a single unit. Direct materials and direct labour activities are also unit level activities, although they do not overhead costs. Cost of unit level activity varies with the number of units produced.

**Batch Level Activity**
These activities which are performed each time a batch of products or group of identical products are produced. All the units of a particular batch are uniform in nature and in size. The cost of batch level activities vary with the number of batches are ascertained. Machine setups, inspections, production scheduling, materials handling are examples of batch level activities which are related to batches.

**Product Level Activities**
These activities which are performed to support the production of each different type of product. Maintenance of equipment, engineering charges, testing routines, maintaining bills of materials etc. are the few examples of product level activities.

**Facility Level Activities**
Facility Level Activities are those which are needed to sustain a factory’s general manufacturing process. These activities are common to a variety of products and are most difficult to link to product specific activities. Factory management, maintenance, security, plant depreciation are the few examples of facility level activities.

3.4.4 Advantages of Activity-Based Costing
ABC system is a very valuable tool of control. It offers a number of advantages to the management and the following are the main advantages:

- It brings accuracy and reliability of the costing data in determination of the cost of the products.
- It facilitates cause and effect relationship to exercise effective cost control.
- It provides necessary cost information to the management to take decisions on any matter, relating to the business.
- It is much helpful in fixing the cost and selling price of a product.
- It facilitates overhead costs allocate directly to the specific product.
- It enables to manage the activities rather than costs.
• It helps to remove all types of wastages and inefficiencies.
• It provides valuable information to evaluate on the relative efficiencies of various plants and machinery.
• Cost Driver Rates will help in significant impact on development of new products or modification of existing products.

3.4.5 Essentials Factors of a Good Activity-Based Costing System
The success of the Activity-Based Costing system depends on the following factors:
• Objectives of costing system and level of competition.
• Number of products manufactured.
• Product diversity and the business
• Adaptation of cost management measures, standardisation and technical aspects.
• Degree of sophistication and suitability to the firm.
• Determination of single or combined cost driver.
• Determination number of activity centre, cost pools and cost drivers.

3.5 Marginal Costing
Marginal Cost: The term Marginal Cost refers to the amount at any given volume of output by which the aggregate costs are charged if the volume of output is changed by one unit. Accordingly, it means that the added or additional cost of an extra unit of output.

Marginal cost may also be defined as the “cost of producing one additional unit of product.” Thus, the concept marginal cost indicates wherever there is a change in the volume of output; certainly there will be some change in the total cost. It is concerned with the changes in variable costs. Fixed cost is treated as a period cost and is transferred to Profit and Loss Account.

Marginal Costing: Marginal Costing may be defined as “the ascertainment by differentiating between fixed cost and variable cost, of marginal cost and of the effect on profit of changes in volume or type of output.” With marginal costing procedure costs are separated into fixed and variable cost.

According to J. Batty, Marginal costing is “a technique of cost accounting pays special attention to the behaviour of costs with changes in the volume of output.” This definition lays emphasis on the ascertainment of marginal costs and also the effect of changes in volume or type of output on the company’s profit.

3.5.1 Features of Marginal Costing
Following are the features of marginal costing:
• All elements of costs are classified into fixed and variable costs.
• Marginal costing is a technique of cost control and decision making.
• Variable costs are charged as the cost of production.
• Valuation of stock of work in progress and finished goods is done on the basis of variable costs. Profit is calculated by deducting the fixed cost from the contribution, i.e., excess of selling price over marginal cost of sales.
• Profitability of various levels of activity is determined by cost volume profit analysis.

3.5.2 Limitations of Marginal Costing
There are various limitations of marginal costing:
• It may be very difficult to segregation of all costs into fixed and variable costs.
• Marginal Costing technique cannot be suitable for all type of industries. For example, it is difficult to apply in ship-building, contract industries etc.
• The elimination of fixed overheads leads to difficulty in determination of selling price.
It assumes that the fixed costs are controllable, but in the long run all costs are variable.
Marginal Costing does not provide any standard for the evaluation of performance which is provided by standard costing and budgetary control.
With the development of advanced technology fixed expenses are proportionally increased. Therefore, the exclusion of fixed cost is less effective.
Under marginal costing elimination of fixed costs results in the under valuation of stock of work in progress and finished goods. It will reflect in true profit.

Marginal Costing focuses its attention on sales aspect. Accordingly, contribution and profits are determined on the basis of sales volume. It does not consider other functional aspects. Under Marginal costing semi variable and semi fixed costs cannot be segregated accurately

Absorption Costing Vs Marginal Costing
The following are the important differences between Absorption Costing and Marginal Costing:

<table>
<thead>
<tr>
<th>Absorption Costing</th>
<th>Marginal Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Absorption Costing all fixed and variable costs are recovered from production.</td>
<td>In Marginal Costing only variable costs are charged to production.</td>
</tr>
<tr>
<td>Absorption Costing valuation of stock of work in progress and finished goods is done on the basis of total costs of both fixed cost and variable cost.</td>
<td>Marginal Costing valuation of stock of work in progress and finished goods at total variable cost only.</td>
</tr>
<tr>
<td>Absorption Costing focuses its attention on long-term decision making.</td>
<td>Marginal Costing focuses on short-term decision making.</td>
</tr>
<tr>
<td>Absorption Costing lays emphasis on production, operation or process.</td>
<td>Costing focuses on selling and pricing aspects</td>
</tr>
</tbody>
</table>

Table 3.1 Difference between absorption costing and marginal costing

3.6 Differential Costing
Differential Costing is also termed as Relevant Costing or Incremental Analysis. Differential Costing is a technique useful for cost control and decision making.

According to ICMA London differential costing “is a technique based on preparation of adhoc information in which only cost and income differences between two alternatives / courses of actions are taken into consideration.”

Marginal Costing and Differential Costing
The following are the differences between Marginal Costing and Differential Costing:

<table>
<thead>
<tr>
<th>Marginal Costing</th>
<th>Differential Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal Costing excludes the entire fixed cost, some of the fixed costs may be taken into account as being relevant for the purpose of Differential Cost Analysis</td>
<td>Differential Costing can be made in the case of both Absorption Costing as well as Marginal Costing</td>
</tr>
<tr>
<td>Marginal Costing may be embodied in the accounting system</td>
<td>Differential Cost is worked separately as analysis statements</td>
</tr>
<tr>
<td>In Marginal costing, margin of contribution and contribution ratios are the main yardstick for the performance evaluation and for decision making</td>
<td>In Differential Cost Analysis differential costs are compared with the incremental or decremental revenues as the case may be</td>
</tr>
</tbody>
</table>

Table 3.2 difference between marginal costing and differential costing
3.7 Cost Volume Profit Analysis

Cost Volume Profit Analysis (CVP) is a systematic method of examining the relationship between changes in the volume of output and changes in total sales revenue, expenses (costs) and net profit. In other words, it is the analysis of the relationship existing amongst costs, sales revenues, output and the resultant profit.

To know the cost, volume and profit relationship, a study of the following is essential:
- Marginal Cost Formula
- Break-Even Analysis
- Profit Volume Ratio (or) PN Ratio
- Profit Graph
- Key Factors and
- Sales Mix

Objectives of cost volume profit analysis
The following are the important objectives of cost volume profit analysis:
- Cost volume is a powerful tool for decision making.
- It makes use of the principles of marginal costing.
- It enables the management to establish what will happen to the financial results if a specified level of activity or volume fluctuates.
- It helps in the determination of break-even point and the level of output required earning a desired profit.
- The p/v ratio serves as a measure of efficiency of each product, factory, sales area etc. And thus helps the management to choose a most profitable line of business.
- It helps us to forecast the level of sales required to maintain a given amount of profit at different levels of prices.

Marginal cost equation
The following are the main important equation of marginal cost:

\[
\text{Sales} = \text{Variable Cost} + \text{Fixed Expenses} \pm \text{Profit/Loss}
\]
\[
\text{(Or)}
\]
\[
\text{Sales} - \text{Variable Cost} = \text{Fixed Cost} \pm \text{Profit or Loss}
\]
\[
\text{(Or)}
\]
\[
\text{Sales} - \text{Variable Cost} = \text{Contribution}
\]
\[
\text{Contribution} = \text{Fixed Cost} + \text{Profit}
\]

The above equation brings the fact that in order to earn profit the contribution must be more than fixed expenses. To avoid any loss, the contribution must be equal to fixed cost.

Contribution
The term Contribution refers to the difference between Sales and Marginal Cost of Sales. It also termed as “Gross Margin.” Contribution enables to meet fixed costs and profit. Thus, contribution will first covered fixed cost and then the balance amount is added to Net profit. Contribution can be represented as:

\[
\text{Contribution} = \text{Sales} - \text{Marginal Cost}
\]
\[
\text{Contribution} = \text{Sales} - \text{Variable Cost}
\]
\[
\text{Contribution} - \text{Fixed Expenses} = \text{Profit}
\]
\[
\text{Sales} - \text{Variable Cost} = \text{Fixed Cost} + \text{Profit}
\]
• C=S-V.C
• C=F.C+P
• S-V.C=F.C+P
• C-F.C=P

Where C= Contribution, S= Sales, V.C = Variable Cost, P = Profit, F.C = Fixed Cost

Example 1
From the following information, calculate the amount of profit using marginal cost technique:

Fixed cost Rs. 3,00,000
Variable cost per unit Rs. 5
Selling price per unit Rs. 10
Output level 1,00,000 units

Solution:

Contribution = Selling Price – Marginal Cost
= (1,00,000 x 10) – (1,00,000 x 5)
= 10,00,000 – 5,00,000
= 5,00,000

Contribution = Fixed Cost + Profit
Rs 5,00,000 = 3,00,000 + Profit
Profit = Contribution – Fixed Cost
Profit = 5,00,000 – 3,00,000
= 2,00,000

3.8 Break-Even Analysis

Break-Even Analysis is also called Cost Volume Profit Analysis. The term Break-Even Analysis is used to measure inter relationship between costs, volume and profit at various level of activity. A concern is said to break-even when its total sales are equal to its total costs. It is a point of no profits no loss. This is a point where contribution is equal to fixed cost. In other words, the break-even point where income is equal to expenditure (or) total sales equal to total cost. The break-even point can be calculated by the following formula:

Break-Even Point in Units

\[
\text{B E P (in units)} = \frac{F}{C}
\]

Break-Even points in Sales Volume

\[
\text{Break-Even Sales} = \frac{(\text{Fixed Cost} \times \text{Sales})}{(\text{Sales} – \text{Variable Cost})}
\]

\[
\text{Break-Even Sales} = \frac{(\text{Fixed Cost})}{(\text{P/V Ratio})}
\]

Profit/Volume Ratio = \[
\frac{(\text{Contribution })}{\text{Sales} \times 100}
\]
Example 2
From the following particulars, calculate:

a. P/V Ratio

b. Profit when sales are Rs 4,000 and

c. New B E P if selling price is reduced by 10%

F.C = Rs 8,000
B E P = Rs 20,000
V.C = Rs 60 per unit

Solution:

a. Break-Even Point = \( \frac{\text{Fixed Cost}}{\text{P/V Ratio}} \)

Therefore P/V Ratio = \( \frac{\text{Fixed Cost}}{\text{B E P}} \)

\[ = \frac{8,000 \times 100}{20,000} \]

\[ = 40\% \]

b. Profit when sales are 40,000

Profit = Sales x P/V Ratio – Fixed Cost

\[ = 40,000 \times 40\% - \text{Rs 8,000} \]

\[ = \text{Rs 16,000} - \text{Rs 8,000} = \text{Rs 8,000} \]

c. New Break-Even Point if the selling price is reduced by 10%. If the selling price is Rs 100, now it is reduced by 10%, i.e., it will be Rs 90.

Variable Cost = Rs 60 per unit

New B E P = \( \frac{(\text{Selling Price} - \text{Variable Cost})}{(\text{Selling Price})\times 100} \)

\[ = \frac{(90 - 60)\times 100}{90} \]

\[ = 33.33\% \]

New Break-Even Point = \( \frac{\text{Fixed Cost}}{\text{New P/V Ratio}} \)

\[ = \frac{8,000}{33.33\%} \]

\[ = \text{Rs 24,002.40} \]
Summary

- Cost accountants, economists and others develop the concept of cost according to their needs because one complete description of ‘cost’ to suit all situations is not possible.
- The acquisition cost is highly objective because it is derived from an independent transaction between two parties i.e. the business entity and the vendor
- Absorption costing is a method whereby you apply part of your fixed overhead costs to the cost of manufacturing products.
- Absorption costing offers an advantage when you do not sell all of your manufactured products during the accounting period.
- Variable costing uses fixed overhead as a lump sum, rather than a per-unit, expense.
- Variable costing shows full payment for fixed-overhead expenses for the accounting period.
- Break-Even Analysis is also called Cost Volume Profit Analysis. The term Break-Even Analysis is used to measure interrelationship between costs, volume and profit at various level of activity.
- Activity-Based Costing (ABC) is that costing in which costs begin with tracing of activities and then to producing the product.
- In Activity-Based Costing, activities are identified and classified into different categories that have relationship with the different stages or parts of the production process.
- Absorption Costing focuses its attention on long-term decision making while under Marginal Costing guidance for short-term decision making.
- Cost Volume Profit Analysis (CVP) is a systematic method of examining the relationship between changes in the volume of output and changes in total sales revenue, expenses (costs) and net profit.
- The term Contribution refers to the difference between Sales and Marginal Cost of Sales.
- Under Marginal costing semi variable and semi fixed costs cannot be segregated accurately.
- Differential Costing can be made in the case of both Absorption Costing as well as Marginal Costing.

References

- Managerial Accounting and Cost Concept [Video online] Available at: <https://www.youtube.com/watch?v=GPKMq_IKptw> [Accessed 16 May 2013].
- Activity Based Costing [Video online] Available at: <https://www.youtube.com/watch?v=7mF3pskW7Hs> [Accessed 16 May 2013].

Recommended Reading

Self Assessment

1. _______ costing is a method whereby you apply part of your fixed overhead costs to the cost of manufacturing products.
   a. Absorption
   b. Variable
   c. Financial
   d. Management

2. The term ___________ refers to the difference between Sales and Marginal Cost of Sales.
   a. accounting
   b. financial
   c. contribution
   d. variable

3. The term ___________ is used to measure interrelationship between costs, volume and profit at various level of activity.
   a. Break-Even Analysis
   b. Activity-Based Costing
   c. Differential Costing
   d. Absorption Costing

4. _______ Costing can be made in the case of both Absorption Costing as well as Marginal Costing.
   a. Absorption
   b. Differential
   c. Financial
   d. Management

5. _______ costing may be defined as “the ascertainment by differentiating between fixed cost and variable cost, of marginal cost and of the effect on profit of changes in volume or type of output.”
   a. Variable
   b. Marginal
   c. Absorption
   d. Financial

6. _______ Level Activities are those which are needed to sustain a factory’s general manufacturing process.
   a. Facility
   b. Batch
   c. Product
   d. Unit

7. Which of the following statements is true?
   a. Financial costing shows full payment for fixed-overhead expenses for the accounting period.
   b. Absorption costing uses fixed overhead as a lump sum, rather than a per-unit, expense.
   c. The term accounting refers to the difference between Sales and Marginal Cost of Sales.
   d. Activity-Based Costing (ABC) is that costing in which costs begin with tracing of activities and then to producing the product.
8. Which of the following statements is false?
   a. The term Break-Even Analysis is used to measure interrelationship between costs, volume and profit at various level of activity.
   b. Marginal Costing can be made in the case of both Absorption Costing as well as Marginal Costing.
   c. The acquisition cost is highly objective because it is derived from an independent transaction between two parties i.e. the business entity and the vendor.
   d. Cost Volume Profit Analysis is a systematic method of examining the relationship between changes in the volume of output and changes in total sales revenue, expenses (costs) and net profit.

9. The _________ cost is highly objective because it is derived from an independent transaction between two parties i.e. the business entity and the vendor.
   a. acquisition
   b. financial
   c. absorption
   d. marginal

10. The cost of _________ level activities vary with the number of batches are ascertained.
    a. batch
    b. facility
    c. product
    d. marginal
Chapter IV
Standard Costing and Variance Analysis

Aim

The aim of this chapter is to:

- explicate the concept of standard costing
- explain the importance of accounting
- elucidate the need for variance analysis

Objectives

The objectives of this chapter are to:

- examine the evolution of standard costing
- analyse the process of sales analysis
- enlist the benefits of standard costing

Learning outcome

At the end of this chapter, you will be able to:

- define material variance
- understand the importance of variance
- identify the various sales variance
4.1 Introduction

The success of a business enterprise depends to a greater extent upon how efficiently and effectively it has controlled its cost. In a broader sense the cost figure may be ascertained and recorded in the form of Historical costing and Pre determined costing. The term Historical costing refers to ascertainment and recording of actual costs incurred after completion of production.

One of the important objectives of cost accounting is effective cost ascertainment and cost control. Historical Costing is not an effective method of exercising cost control because it is not applied according to a planned course of action. And also it does not provide any yardstick that can be used for evaluating actual performance. Based on the limitations of historical costing it is essential to know before production begins what the cost should be so that exact reasons for failure to achieve the target can be identified and the responsibility be fixed. For such an approach to the identification of reasons to evaluate the performance, suitable measures may be suggested and taken to correct the deficiencies.

4.2 Standard Cost

The word “Standard” means a “Yardstick” or “Bench Mark.” The term “Standard Costs” refers to Pre-determined costs. Brown and Howard define Standard Cost as a Pre-determined Cost which determines what each product or service should cost under given circumstances. This definition states that standard costs represent planned cost of a product. Standard Cost as defined by the Institute of Cost and Management Accountant, London “is the Predetermined Cost based on technical estimate for materials, labour and overhead for a selected period of time and for a prescribed set of working conditions.”

4.2.1 Standard costing

Standard Costing is a concept of accounting for determination of standard for each element of costs. These predetermined costs are compared with actual costs to find out the deviations known as “Variances.” Identification and analysis of causes for such variances and remedial measures should be taken in order to overcome the reasons for Variances.

The planned unit cost of the product, component or service produced in a period. The standard cost may be determined on a number of bases. The main use of standard costs is in performance measurement, control, and stock valuation and in the establishment of selling prices.

A standard costing system consists of the following four elements:

- Setting standards for each operation
- Comparing actual with standard performance
- Analysing and reporting variances arising from the difference between actual and standard performance
- Investigating significant variances and taking appropriate competitive action

Chartered Institute of Management Accountants England defines Standard Costing as “the Preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence.” From the above definition, the technique of Standard Costing may be summarised as follows:

- Determination of appropriate standards for each element of cost.
- Ascertaining of information about actual and use of Standard Costs.
- Comparison of actual costs with Standard Costs, the differences known as Variances.
- Analysis of Variances to find out the causes of Variances.
- Reporting to the responsible authority for taking remedial measures.
4.2.2 Difference between Estimated Costs and Standard Costs

Although, Pre-determination is the essence of both standard costing and estimated costing, the two differ from each other in the following respects:

<table>
<thead>
<tr>
<th>Standard costing</th>
<th>Estimated costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is used on the basis of scientific.</td>
<td>It is used on the basis of statistical facts and figures.</td>
</tr>
<tr>
<td>It emphasises “what the cost should be.”</td>
<td>It emphasises “what the cost will be.”</td>
</tr>
<tr>
<td>It is used to evaluate actual performance and serves as an effective tool of cost.</td>
<td>It is used to cost ascertainment for fixing sales price.</td>
</tr>
<tr>
<td>It is applied to any industry engaged in production.</td>
<td>It is applicable to concern engaged in construction work.</td>
</tr>
<tr>
<td>It is a part of accounting system and standard costing variances are recorded in the books of accounts.</td>
<td>It is not a part of accounting system because it is based on statistical facts and figures.</td>
</tr>
</tbody>
</table>

Table 4.1 Difference between estimated costs and standard costs

4.2.3 Compare and Contrast Between Standard Costing and Budgetary Control

Relationship: The following are certain basic principles common to both Standard Costing and Budgetary Control:

- Determination of standards for each element of costs in advance.
- For both of them measurement of actual performance is targeted.
- Comparison of actual costs with standard cost to find out deviations.
- Analysis of variances to find out the causes.
- Give the periodic report to take corrective measures.

Differences

Though Standard Costing and Budgetary Controls are aims at the maximum efficiencies and Marginal Cost, yet there are some basic differences between the two from the objectives of using the two costs.

<table>
<thead>
<tr>
<th>Budgetary Control</th>
<th>Standard Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgets are projections of financial accounts.</td>
<td>Standard Costing is a projection of cost accounts.</td>
</tr>
<tr>
<td>As a statement of both income and expenses it forms part of budgetary control.</td>
<td>Standard costing is not used for the purpose of forecasting.</td>
</tr>
<tr>
<td>Budgets are estimated costs. They are “what the cost will be.”</td>
<td>Standard Cost are the “Norms” or “what cost should be.”</td>
</tr>
<tr>
<td>Budget can be operated with standards.</td>
<td>Standard Costing cannot be used without budgets Under standard costing variances are revealed through different accounts.</td>
</tr>
<tr>
<td>In budgetary control variances are not revealed through the accounts.</td>
<td>Under standard costing variances are revealed through different accounts.</td>
</tr>
<tr>
<td>Budgets are prepared on the basis of historical facts and figures.</td>
<td>Standard cost are planned and prepared on the basis of technical estimates.</td>
</tr>
</tbody>
</table>

Table 4.2 Difference between standard costing and budgetary controls
4.2.4 Advantages of Standard Costing
The following are the important advantages of standard costing:

- It guides the management to evaluate the production performance.
- It helps the management in fixing standards.
- Standard costing is useful in formulating production planning and price policies.
- It guides as a measuring rod for determination of variances.
- It facilitates eliminating inefficiencies by taking corrective measures.
- It acts as an effective tool of cost control.
- It helps the management in taking important decisions.
- It facilitates the principle of “management by exception.”
- Effective cost reporting system is possible.

4.2.5 Limitations of Standard Costing
Besides all the benefits derived from this system, it has a number of limitations which are given below:

- Standard costing is expensive and a small concern may not meet the cost.
- Due to lack of technical aspects, it is difficult to establish standards.
- Standard costing cannot be applied in the case of a concern where non-standardised products are produced.
- Fixing of responsibility is difficult. Responsibility cannot be fixed in the case of uncontrollable variances.
- Frequent revision is required while insufficient staff is incapable of operating this system. Adverse psychological effects and frequent technological changes standard costing system.

4.2.6 Determination of Standard Costs
The following preliminary steps must be taken before determination of standard cost:

- Establishment of cost centers
- Classification and codification of accounts
- Types of standards to be applied.
  - Ideal standard
  - Basic standard
  - Current standard
  - Expected standard normal standard
- Organisation for standard costing
- Settings of standards

4.2.6.1 Establishment of Cost Centers
It is the first step required before setting of standards. According to CIMA, London Cost Centre is “a location, person or item of equipment for which costs may be ascertained and used for the purpose of cost control.” Cost centre is necessary for the determination of standard costs for each product and comparison of actual cost with the predetermined standards to ascertain the deviations to take corrective measures.

4.2.6.2 Classification and Codification of Accounts
Classification of Accounts and Codification of different items of expenses and incomes help quick ascertainment and analysis of cost information.

4.2.6.3 Types of Standards to be applied
Determination of the type of standard to be used is one of the important steps before setting up of standard cost. The different types of standards are given below:

- Ideal standard
- Basic standard
Current standard

Expected standard

Normal standard

Ideal standard

The term “Ideal Standard” refers to the standard which can be attained under the most favorable conditions possible. In other words, ideal standard is based on high degree of efficiency. It assumes that there is no wastage, no machine breakdown, no power failure, no labour ideal time in the production process. In practice it is difficult to attain this ideal standard.

Basic standard

This standard is otherwise known as Bogey Standard. Basic Standard which is established for use is unaltered over a long period of time. In other words this standard is fixed in relation to a base year and is not changed in response to changes in material costs, labour costs and other expenses as the case may be. The application of this standard has no practical importance from cost control and cost ascertainment point of view.

Current standard

The term “Current Standard” refers to “a standard established for use over a short period of time related to current conditions which reflects the performance that should be attained during the period.” These standards are more suitable and realistic for control purposes.

Expected standard

Expected Standard may be defined as “the standard which may be anticipated to be attained during a future specified budget period.” These standards set targets which can be achieved in a normal situation. As such it is more realistic than the Ideal Standard.

Normal standard

This standard represents an average standard in past which, it is anticipated, can be attained over a future period of time, preferably long enough to cover one trade cycle. The usefulness of such standards is very limited for the purpose of cost control.

4.2.6.4 Organisation for Standard Costing

The success of the standard costing system depends upon the reliability of standards. Hence the responsibility for setting standard is vested with the Standard Committee. It consists of

- Purchase manager
- Production manager
- Personnel manager
- Time and motion study engineers
- Marketing Manager and Cost Accountant

4.2.6.5 Setting of Standard

The Standard Committee is responsible for setting standards for each element of costs as given below:

- Direct material
- Direct labour
- Overheads
  - Fixed overheads
  - Variable overheads
Standard for direct material cost
The following are the standard involved in direct material cost:

• Material usage standard: Material Usage Standard is prepared on the basis of material specifications and quality of materials required to manufacture a product. While setting of standards proper allowance should be provided for normal losses due to unavoidable occurrence of evaporation, breakage etc.

• Material price standard: Material Price Standard is calculated by the Cost Accountant and the Purchase Manager for each type of materials. When this type of standard is used, it is essential to consider the important factors such as market conditions, forecasting relating to the trends of prices, discounts etc.

Standard for direct labour cost
The following standards are established:

Fixation of standard labour time
Labour Standard time is fixed and it depends upon the nature of cost unit, nature of operations performed, time and motion study etc. While determining the standard time normal ideal time is allowed for fatigue and other contingencies.

Fixation of Standard Rates
The standard rate fixed for each job will be determined on the basis of methods of wage payment such as Time Wage System, Piece Wage System, Differential Piece Rate System and Premium Plan etc.

Setting standards for overheads
The following problems are involved while setting standards for overheads:

• Determination of standard overhead cost

• Estimating the production level of activity to be measured machine hours, units of production and labour hours.

Setting of overhead standards is divided into fixed overhead, Variable overhead and semi-variable overhead. The determination of overhead rate may be calculated as follows:

a. Standard Overhead Rate = \( \frac{\text{Standard overhead for the budget period}}{\text{Standard production for the budget period}} \)

b. Standard Variable Overhead Rate = \( \frac{\text{Standard overhead for the budget period}}{\text{Standard production for the budget period}} \)

Standard Production for the budget period Standard Hour
Usually production is expressed in terms of units, dozen, kgs, pound, litres, etc. When productions are of different types, all products cannot be expressed in one unit. Under such circumstances, it is essential to have a common unit for all the products. Time factor is common to all the operation. ICMA, London, defines a Standard Time as a “hypothetical unit pre-established to represent the amount of work which should be performed in one hour at standard performance.”

Standard Cost Card
After fixing the Standards for direct material, direct labour and overhead cost, they are recorded in a Standard Cost Card. This Standard cost is presented for each unit cost of a product. The total Standard Cost of manufacturing a product can be obtained by aggregating the different Standard Cost Cards of different processes. These Cost Cards are useful to the firm in production planning and pricing policies.
4.3 Variance Analysis

Standard Costing guides as a measuring rod to the management for determination of “Variances” in order to evaluate the production performance. The term “Variances” may be defined as the difference between Standard Cost and actual cost for each element of cost incurred during a particular period. The term “Variance Analysis” may be defined as the process of analyzing variance by subdividing the total variance in such a way that management can assign responsibility for off-Standard Performance.

The variance may be favorable variance or unfavorable variance. When the actual performance is better than the Standard, it presents “Favorable Variance.” Similarly, where actual performance is below the standard it is called as “Unfavorable Variance.”

Variance analysis helps to fix the responsibility so that management can ascertain:

- the amount of the variance
- the reasons for the difference between the actual performance and budgeted performance
- the person responsible for poor performance
- remedial actions to be taken

4.4 Types of Variances

Variances may be broadly classified into two categories as follows:

- Cost variance
- Sales variance

4.4.1 Cost Variance

Total Cost Variance is the difference between Standards Cost for the Actual Output and the Actual Total Cost incurred for manufacturing actual output. The Total Cost Variance Comprises the following:

- Direct Material Cost Variance (DMCV)
- Direct Labour Cost Variance (DLCV)
- Overhead Cost Variance (OCV)

4.4.1.1 Direct Material Cost Variance

Direct Material Variances are also termed as Material Cost Variances. The Material Cost Variance is the difference between the Standard cost of materials for the Actual Output and the Actual Cost of materials used for producing actual output. The Material Cost Variance is calculated as:

Material Cost Variance = Standard Cost – Actual Cost

Material Cost Variance = \( \left\{ \frac{\text{Standard}}{\text{Quantity}} \times \frac{\text{Standard}}{\text{Price}} \right\} – \left\{ \frac{\text{Actual}}{\text{Quantity}} \times \frac{\text{Actual}}{\text{Price}} \right\} \)

If the actual costs is more than standard cost the variance will be unfavorable or adverse variance and. other hand. If the actual cost is less than standard cost the variance will be favorable variance. The material variance is further classified into:

- Material Price Variance
- Material Usage Variance
- Material Mix Variance
- Material Yield Variance
Material Price Variance (MPV)
Material Price Variance is that portion of the Material Cost Variance which is due to the difference between the Standard Price specified and the Actual Price paid for purchase of materials. Material Price Variance may be calculated by:

\[
\text{Material Price Variance} = \frac{\text{Actual Quantity}}{\text{Standard Price}} \times \left\{ \frac{\text{Standard Price}}{\text{Actual Price}} - 1 \right\}
\]

If actual cost of materials used is more than the standard cost the variance is adverse, it represents negative (-) symbol, and on the other hand, if the variance is favorable it is to be represented by positive (+) symbol.

Material Usage Variance (MUV)
Material Usage Variance is that part of Material Cost Variance which refers to the difference between the standard cost of standard quantity of material for actual output and the Standard cost of the actual material used. Material Usage Variance is calculated as follows:

\[
\text{Material Price Variance} = \frac{\text{Standard Quantity}}{\text{Price}} \times \left\{ \frac{\text{Standard Price}}{\text{Quantity}} - \frac{\text{Actual Price}}{\text{Quantity}} \right\}
\]

This Variance will be favorable when standard cost of actual material is more than the Standard material cost for actual output, and Vice Versa.

Material Mix Variance (MMV)
It is the portion of the material usage variance which is due to the difference between the Standard and the actual composition of mix. Material Mix Variance is calculated under two situations as follows:

• when actual weight of mix is equal to standard weight to mix
• when actual weight of mix is different from the standard mix

When Actual Weight and Standard Weight of Mix are equal:
The formulae used to calculate the Variance:

\[
\text{Material Price Variance} = \frac{\text{Standard Quantity}}{\text{Price}} \times \left\{ \frac{\text{Standard Price}}{\text{Quantity}} - \frac{\text{Actual Price}}{\text{Quantity}} \right\}
\]

In case the standard quantity is revised due to storage of particular category of materials the formulae will be changed as follows:

\[
\text{Material mix variance} = \frac{\text{Standard Quantity}}{\text{Price}} \times \left\{ \frac{\text{Revised Standard Price}}{\text{Quantity}} - \frac{\text{Actual Price}}{\text{Quantity}} \right\}
\]

When Actual Weight and Standard Weight of Mix are different:
The formulae will be as follows:

\[
\text{Material mix variance} = \left( \frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Standard Mix}} \right) \times \left( \frac{\text{Standard cost of Standard mix}}{\text{Standard cost of Actual mix}} \right) - \left( \frac{\text{Standard cost of Standard mix}}{\text{Standard cost of Actual mix}} \right)
\]

In case the standard is revised then the formulae will be as follows:

\[
\text{Material Mix Variance} = \left( \frac{\text{Total Weight of Actual Mix}}{\text{Total Weight of Standard Mix}} \right) \times \left( \frac{\text{Revised Standard cost of Standard mix}}{\text{Revised Standard cost of Actual mix}} \right) - \left( \frac{\text{Standard cost of Standard mix}}{\text{Standard cost of Actual mix}} \right)
\]
Materials Yield Variance (MYV)

It is the portion of Material Usage Variance. This variance arises due to spoilage, low quality of materials and defective production planning etc. Materials Yield Variance may be defined as “the difference between the Standard Yield Specified and the Actual Yield Obtained.” This variance may be calculated as under:

Material Mix Variance = \[ \text{Standard Rate} \times \{ \frac{\text{Actual Yield}}{\text{Standard Yield}} \} \]

Where Standard Rate is calculated as follows:

\[ \text{Standard Rate} = \frac{\text{Standard Cost of Standard Mix}}{\text{Net Standard Output}} \]

The following equations may be used for verification of Material Cost Variances:

- Material Cost Variances = Material Price Variances + Material Usage Variances
- Material Usage Variances = Material Mix Variances - Material Yield Variances
- Material Cost Variances = Material Mix Variances + Material Yield Variances

**Example 1:**

Calculate Material Cost Variance from the following information:

- Standard Price of material per kg = Rs. 4
- Standard Usage of materials = 800 kgs
- Actual Usage of materials = 920 kgs
- Actual Price of materials per kg = Rs. 3
- Actual Cost of materials Rs. 2,760
- Standard cost of material for actual production Rs. 3,200

Solution:=

Material Cost Variances = \[ \{ \frac{\text{Standard Price}}{\text{Quantity}} \} \times \{ \frac{\text{Standard Price}}{\text{Actual Price}} \} \times \{ \frac{\text{Actual Quantity}}{\text{Quantity}} \} \]

\[ = (4 \times 800) - (3 \times 920) = Rs 3,200 - Rs 2,760 = Rs 440 \text{ (F)} \]

Material Price Variances = \[ \frac{\text{Actual Quantity}}{\text{Price}} \times \{ \frac{\text{Standard Price}}{\text{Actual Price}} \} \]

\[ = 920 (4 - 3) = 920 \times \text{Re.} 1 = Rs. 920 \text{ (F)} \]

Material Usage Variances = \[ \frac{\text{Standard Price}}{\text{Quantity}} \times \{ \frac{\text{Standard Price}}{\text{Actual Price}} \} \times \{ \frac{\text{Actual Quantity}}{\text{Quantity}} \} \]

\[ = 4(800 \times 920) = 4 \times 120 = Rs 480 \text{ (A)} \]

**4.4.1.2 Direct Labour Cost Variance**

Labour Variances can be classified into:

- Labour Cost Variance
- Labour Rate Variance or Wage Rate Variance
- Labour Efficiency Variance
- Labour Idle Time Variance
- Labour Mix Variance
- Labour Revised Efficiency Variance
- Labour Yield Variance
Labour Cost Variance (LCV)
Labour Cost Variance is the difference between the Standard Cost of labour allowed for the actual output achieved and the actual wages paid. It is also termed as Direct Wage Variance or Wage Variance. Labour Cost Variance is calculated as follows:

Labour Cost Variance = Standard Cost of Labour - Actual Cost of Labour

Labour Cost Variance = \left( \frac{\text{Standard Rate}}{\text{Standard Time for Actual Output}} \right) \times \left( \frac{\text{Actual Rate}}{\text{Actual Time}} \right)

Or

Labour Cost Variance = \left( \frac{\text{Standard Rate}}{\text{Actual Rate}} \right) \times \left( \frac{\text{Standard Time for Actual Output}}{\text{Actual Time}} \right)

If actual labour cost is more than the standard labour cost, the variance represents negative and vice versa.

Labour Rate Variance
It is that part of labour cost variance which is due to the difference between the standard rate specified and the actual rate paid. These variances arise from the following reasons:

• Change in wage rate
• Faulty recruitment
• Payment of overtime
• Employment of casual workers, etc.

It is expressed as follows:

Labour Rate Variance = \text{Actual Time} \left( \frac{\text{Standard Rate}}{\text{Actual Rate}} \right)

If the Standard rate is higher than the actual rate, the variance will be favourable and vice versa.

Labour Efficiency Variance
Labour Efficiency Variance otherwise known as Labour Time Variance. It is that portion of the Labour Cost Variance which arises due to the difference between standard labour hours specified and the actual labour hours spent. The usual reasons for this variance are

• Poor supervision
• Poor working condition
• Increase in labour turnover
• Defective materials

If actual time taken is more than the specified standard time, the variance represents unfavorable and vice versa.

Labour Idle Time Variance
Labour Idle Time Variance arises due to abnormal situations like strikes, lockout, breakdown of machinery etc. In other words, idle time occurs due to the difference between the time for which workers are paid and that which they actually expend upon production.

It is calculated as follows:

Idle Time Variance = \text{Idle Hours} \times \text{Standard Rate}

Labour Mix Variance
It is otherwise known as Gang Composition Variance. This variance arises due to the differences between the actual gang compositions than the standard gang composition. Labour Mix Variance is calculated in the same way of Materials Mix Variance. This variance is calculated in two ways:

• When Standard Labour Mix is equal to Actual Labour Mix
• When Standard Labour mix is different from Actual Labour Mix
When Standard Labour Mix is equal to Actual Labour Mix
The formulae for its computations may be as follows:

\[
\text{Labour Mix Variance} = \left( \frac{\text{Standard Cost of Standard Labour Mix}}{\text{Standard Labour Mix}} \times \frac{\text{Standard Cost of Actual Labour Mix}}{\text{Actual Labour Mix}} \right)
\]

When Standard and actual times of the labour mix are different
Changes in the composition of a gang may arise due to shortage of a particular grade of labour. It may be calculated as follows:

\[
\text{Labour Mix Variance} = \left\{ \frac{\text{Revised Standard Time} - \text{Actual Time}}{\text{Actual Time}} \right\} \times \left\{ \frac{\text{Standard Rate}}{\text{Rate}} \right\}
\]

\[
\text{Revised Standard Time} = \frac{\text{Total Actual Time}}{\text{Total Standard Time}} \times \text{Actual Time}
\]

Labour Yield Variance
This variance is calculated in the same way as Material Yield Variance. Labour Yield Variance arises due to the variation in labour cost on account of increase or decrease in yield or output as compared to relative standard. The formula for this purpose is as follows:

\[
\text{Labour Yield Variance} = \left( \frac{\text{Standard Labour Cost per unit of output}}{\text{Standard Labour Cost per unit of output}} \times \frac{\text{Standard Output for Actual Time} - \text{Actual Output}}{\text{Output}} \right)
\]

If actual output is more than Standard output for actual time, the variance is favourable and vice versa.

Verification:
Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance

Example 2:
From the following particulars, calculate Labour Variance:
Standard hours = 200
Standard rate for actual production = Rs. 1 per hour
Actual Hour = 190
Actual Rate = Rs. 1.25 per hour

Solution:
Labour Cost Variance = \left( \frac{\text{Standard Hours}}{\text{Rate}} \times \frac{\text{Standard Rate}}{\text{Rate}} \right) - (\text{Actual Hours} \times \text{Actual Rate})
= Rs 200 - Rs 237.50 = Rs 37.50 (A)

Labour Rate Variance = \left( \frac{\text{Standard Rate}}{\text{Rate}} - \frac{\text{Actual Rate}}{\text{Rate}} \right) \times \text{Actual Hours}
= (Rs. 1 - Rs. 1.25) \times 190
= Rs. 0.25 \times 190 = Rs. 47.50 (A)

Labour Efficiency Variance = \left( \frac{\text{Standard Hours}}{\text{Hours}} - \frac{\text{Actual Hours}}{\text{Hours}} \right) \times \text{Standard Rate}
= (200 - 190) \times \text{Rs. 1}
= Rs.10 (F)
Verification:
Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance
Rs. 37.50 (A) = Rs.47.50 (A) + Rs. 10 (F)
Rs. 37.50 (A) = Rs. 37.50 (A)

4.4.1.3 Overhead Cost Variance
Overhead may be defined as the aggregate of indirect material cost, indirect labour cost and indirect expenses. Overhead Variances may arise due to the difference between standard cost of overhead for actual production and the actual overhead cost incurred. The Overhead Cost Variance may be calculated as follows:

Overhead Cost Variance = \left( \frac{\text{Standard Overhead Rate Per Unit}}{\text{Actual Output}} - \frac{\text{Actual Overhead Cost}}{\text{Actual Overhead Rate Per Hour}} \right) \times \text{Actual Output}

Or

\left( \frac{\text{Actual Output}}{\text{Standard Hours for Actual Output}} \right) \times \text{Standard Overhead Rate Per Hour} - \text{Actual Overhead Cost}

Essentials of certain terms
For the purpose of measuring various Overhead Variances it is essential to know certain technical terms related to overheads are given below:

Standard Overhead Rate per unit = \frac{\text{Budgeted Overheads}}{\text{Budgeted Outputs}}

Standard Overhead Rate per hour = \frac{\text{Budgeted Overheads}}{\text{Budgeted Hours}}

Standard Output for Actual Time = \frac{\text{Budgeted Outputs}}{\text{Budgeted Hours}}

Standard Hours for Actual Output = \frac{\text{Budgeted Hours}}{\text{Budgeted Output}}

When Output is measured in Standard Hours

Recorded Overheads = \left( \frac{\text{Standard Rate Per Hour}}{\text{Actual Output}} \right) - \text{Standard Hours for Actual Output}

Classification of overhead variance
Overhead Variances can be classified as:

Variable Overhead Variances
• Variable Overhead Cost Variance
• Variable Overhead Expenditure Variance
• Variable Overhead Efficiency Variance

Fixed Overhead Variance
• Fixed Overhead Cost Variance
• Fixed Overhead Expenditure Variance
• Fixed Overhead Volume Variance
• Fixed Overhead Capacity Variance
• Fixed Overhead Efficiency Variance
• Fixed Overhead Calendar Variance
Variable overhead cost variance:
This is the difference between standard variable overhead for actual production and the actual variable overhead incurred. The formula is as follows:

Variable Overhead Cost Variance = \{ \text{Standard Variable Overhead} \} \text{ For Actual Output } - \{ \text{Actual Variable Overhead} \}

Variable overhead expenditure variance (VOEV)
It is the difference between standard variable overheads allowed for actual hours worked and the actual variable overhead incurred. This variable may be calculated as follows:

VOEV = \{ \text{Standard Variable Overhead Rate Per Hour} \} \times \{ \text{Actual Time} \} - \{ \text{Actual Variable Overhead Rate Per Hour} \} \times \{ \text{Time} \}

Variable overhead efficiency variance
This variance arises due to the difference between variable overhead recovered from actual output produced and the standard variable overhead for actual hours worked. The formula is a follows:

\{ \text{Variable Overhead Efficiency Variance} \} = \text{Standard Rate Per Hour} \times \{ \text{Standard Hours For Actual Production} \} - \text{Actual Hours}

Example 3:
From the following particulars, compute the variable overhead variances:
Output in units
Standard = 2,500 units  Actual = 2,000 units
Labour Hours
Standard = 5,000 units  Actual = 6,000 units
Variable Overheads
Standard = Rs 1,000  Actual = Rs 1,500

Solution:
Standard Overhead Rate per hour = \frac{\text{Budgeted Overheads}}{\text{Budgeted Hours}}
= \frac{1,000}{5,000} = 0.20 \text{ per hour}

Standard Variable Overhead rate per Unit of output = \frac{\text{Budgeted Overheads}}{\text{Budgeted Hours}}
= \frac{1,000}{5,000} = 0.40 \text{ per hour}

Calculations of Variances

Variable Overhead Cost Variance = \{ \text{Actual Variable Overhead} \} - \{ \text{Standard Variable Overhead} \} \text{ For Actual Production}
= 1,500 – (2,000 \times 0.40)
= Rs 1,500 – Rs 800 = Rs 700 (A)

VOEV = \{ \text{Actual Variable Overheads} \} - \{ \text{Standard variable Overhead} \} \text{ For Actual Hours Worked}
= 1,500 – (6,000 \times 0.20)
= Rs 1,500 – Rs 1,200 = Rs 300 (A)

Variable Overhead Efficiency Variance
= \{ \text{Standard Variable Overhead} \} \text{ For Actual Hours} - \{ \text{Standard Variable Overhead} \} \text{ For Actual Output}
Fixed Overhead Cost Variance
It is that portion of overhead cost variance which is due to over absorption or under absorption of overhead for the actual production. In other words, the variance is the difference between the standard fixed overheads allowed for the actual production and the actual fixed overheads incurred. The variance can be calculated as follows:

\[
\text{Fixed Overhead Cost Variance} = (\text{Actual Fixed Overheads}) - (\text{Standard Fixed Overhead For Actual Production})
\]

Fixed Overhead Expenditure Variance
This is otherwise termed as “Budget Variance.” It is the difference between the budgeted fixed overheads and the actual fixed overheads incurred during the particular period. The formula for calculation of this Variance is

\[
\text{Fixed Overhead Expenditure Variance} = (\text{Budgeted Fixed Overheads}) - (\text{Actual Fixed Overheads})
\]

Fixed Overhead Volume Variance
This Variance is the difference between the budgeted fixed overheads and the standard fixed overheads recovered on the actual production. The formula is as follows:

\[
\text{Fixed Overhead Volume Variance} = (\text{Budgeted Fixed Overheads}) - (\text{Standard Fixed Overhead on Actual Production})
\]

Fixed Overhead Capacity Variance
This is that portion of volume variance which is due to working at higher or lower capacity than the budgeted capacity. In other words, fixed overhead capacity variance arising due to a particular cause, i.e., unexpected holidays, breakdown of machinery, strikes, power failure etc. This is calculated as follows:

\[
\text{Fixed Overhead Capacity Variance} = (\text{Actual Hours Worked} - \text{Budgeted Hours}) \times \text{Standard Fixed Overhead Rate Per Hour}
\]

Fixed Overhead Efficiency Variance
It is that portion of the Volume Variance which shows the lower or higher output arising from the efficiency or inefficiency of the workers. This is an outcome of the performance of the workers and is calculated as:

\[
\text{Fixed Overhead Efficiency Variance} = \frac{\text{Standard Fixed Overhead Rate Per Hour}}{\text{Quality}} \times (\text{Standard Quality} - \text{Actual Quality})
\]

Fixed Overhead Calendar Variance
This is part of Capacity Variance which is due to the difference between the actual number of working days and the budgeted working days. Calendar Variance can be calculated as follows:

\[
\text{Fixed Overhead Calendar Variance} = \frac{\text{Standard Rate Per Hour}}{\text{Excess or Deficit Hours Or Days Worked}}
\]
**Combined Overhead Variances**
Analysis of overhead variance can be calculated by combined overhead variances methods. It may be:

- Two Variance Method and
- Three Variance Method

**Two Variance Method**
If the Overhead Variances are analysed on the basis of both expenditure and volume is called as “Two Variance Analysis.”

4.4.2 Sales Variance
The Variances so far analysed are related to the cost of goods sold. Quantum of profit is derived from the difference between the cost and sales revenue. Cost Variances influence the amount of profit favourably or adversely depending upon the cost from materials, labour and overheads. In addition, it is essential to analyse the difference between actual sales and the targeted sales because this difference will have a direct impact on the profit and sales. Therefore the analysis of sales variances is important to study profit variances.

Sales Variances can be calculated by two methods:

- Sales Value Method
- Sales Margin Or Profit Method

4.4.2.1 Sales Value Method
The method of computing sales variance is used to denote variances arising due to change in sales price, sales volume or the sales value. The sales variances may be classified as follows:

- Sales Value Variance
- Sales Price Variance
- Sales Volume Variance
- Sales Mix Variance
- Sales Quantity Variance

**Sales Value Variance**
This Variance refers to the difference between budgeted sales and actual. It may be calculated as follows:

\[
\text{Sales Value Variance} = \text{Actual Value of Sales} - \text{Budgeted Value of Sales}
\]

**Sales Price Variance**
This is the portion of Sales Value Variance which is due to the difference between standard price of actual quantity and actual price of the actual quantity of sales. The formula is:

\[
\text{Sales Price Variance} = \text{Actual Quantity} \times (\text{Standard Price} - \text{Actual Price})
\]

**Sales Volume Variance**
It is that part of Sales Value Variance which is due to the difference between the actual quantity and volume of sales and budgeted quantity or volume of sales. The variance is calculated as:

\[
\text{Sales Volume Variance} = \left(\frac{\text{Actual Quantity}}{\text{of Sales}} - \frac{\text{Budgeted Quantity}}{\text{of Sales}}\right) \times \text{Standard Price}
\]

**Sales Mix Variance**
It is that portion of Sales Volume Variance which is due to the difference between the standard proportion of sales and the actual composition or mix of quantities sold. In other words it is the difference of standard value of revised mix and standard value of actual mix: It is calculated as:

\[
\text{Sales Mix Variance} = \left(\frac{\text{Standard Value}}{\text{of Actual Mix}} - \frac{\text{Standard Value}}{\text{Revised Standard Mix}}\right)
\]
Sales Quantity Variance
It is a sub variance of Sales Volume Variance. This is the difference between the revised standard quantity of sales and budgeted sales quantity. The formula for the calculation of this variance is:

\[
\text{Sales Quantity Variance} = \left( \frac{\text{Revised Standard Sales Quantity}}{\text{Budgeted Sales Quantity}} - 1 \right) \times \text{Standard Selling Price}
\]

4.4.2.2 Sales Margin or Sales Profit
Under this method of variance analysis, variances may be computed to show the effect on profit. The sales variance according to this method can be classified as follows:

- Sales Margin Value Variance
- Sales Margin Volume Or Quantity Variance
- Sales Margin Price Variance
- Sales Margin mix variance

Sales Margin Value Variance
This is the difference between the actual value of sales margin and budgeted value of sales margin. It is calculated as follows:

\[
\text{Sales Margin Value Variance} = \text{Budgeted Profit} - \text{Actual Profit}
\]

Sales Margin Volume Variance
It is that portion of Total Sales Margin Variance which is due to the difference between budgeted and actual quantity sold. The formula is as follows:

\[
\text{Sales Margin Volume Variance} = \left( \frac{\text{Standard Quantity}}{\text{Actual Quantity}} - 1 \right) \times \text{Standard Profit}
\]

Sales Margin Price Variance
This variance is the difference between the standard price of the quantity of the sales affected and the actual price of those sales. It is calculated as follow:

\[
\text{Sales Margin Price Variance} = \text{Standard Profit} - \text{Actual Profit}
\]
Summary

- The success of a business enterprise depends to a greater extent upon how efficiently and effectively it has controlled its cost.
- The term Historical costing refers to ascertainment and recording of actual costs incurred after completion of production.
- Standard Cost as defined by the Institute of Cost and Management Accountant, London “is the Predetermined Cost based on technical estimate for materials, labour and overhead for a selected period of time and for a prescribed set of working conditions.”
- Standard costing is not used for the purpose of forecasting.
- The term “Ideal Standard” refers to the standard which can be attained under the most favourable conditions possible.
- Cost Variances influence the amount of profit favourably or adversely depending upon the cost from materials, labour and overheads.
- Overhead may be defined as the aggregate of indirect material cost, indirect labour cost and indirect expenses.
- Labour Cost Variance is the difference between the Standard Cost of labour allowed for the actual output achieved and the actual wages paid.
- Material Usage Variance is that part of Material Cost Variance which refers to the difference between the standard cost of standard quantity of material for actual output and the Standard cost of the actual material used.
- Budgets are projections of financial accounts.
- The term “Variances” may be defined as the difference between Standard Cost and actual cost for each element of cost incurred during a particular period
- The term “Variance Analysis” may be defined as the process of analyzing variance by subdividing the total variance in such a way that management can assign responsibility for off-Standard Performance.

References


Recommended Reading

**Self Assessment**

1. **Cost Variance** is the difference between the Standard Cost of labour allowed for the actual output achieved and the actual wages paid.
   a. Labour
   b. Budget
   c. Material
   d. Standard

2. __________ may be defined as the aggregate of indirect material cost, indirect labour cost and indirect expenses.
   a. Sale
   b. Labour
   c. Overhead
   d. Yield

3. Standard costing is not used for the purpose of __________.
   a. forecasting
   b. operations
   c. success
   d. labour

4. The term __________ refers to the standard which can be attained under the most favourable conditions possible.
   a. cost standard
   b. ideal standard
   c. material standard
   d. operation standard

5. __________ Costing is not an effective method of exercising cost control because it is not applied according to a planned course of action.
   a. Standard
   b. Historical
   c. Labour
   d. Material

6. __________ may be defined as “the difference between the Standard Yield Specified and the Actual Yield Obtained.”
   a. Material Labour Variance
   b. Material Cost Variance
   c. Materials Yield Variance
   d. Materials Efficiency Variance

7. Which of the following statements is true?
   a. The term “Ideal Standard” refers to the standard which can be attained under the most favourable conditions possible.
   b. Cost variance may be defined as the aggregate of indirect material cost, indirect labour cost and indirect expenses.
   c. Standard Costing are projections of financial accounts.
   d. Standard costing is not used for the purpose of operations.
8. Which of the following statements is false?
   a. The term “Variances” may be defined as the difference between Standard Cost and actual cost for each element of cost incurred during a particular period.
   b. Overheads may be defined as the aggregate of indirect material cost, indirect labour cost and indirect expenses.
   c. Material Labour Variance may be defined as “the difference between the Standard Yield Specified and the Actual Yield Obtained.”
   d. Historical Costing is not an effective method of exercising cost control because it is not applied according to a planned course of action.

9. __________ is otherwise known as Gang Composition.
   a. Labour mix variance
   b. Labour cost variance
   c. Labour yield variance
   d. Labour material variance

10. __________ may be defined as the process of analyzing variance by subdividing the total variance in such a way that management can assign responsibility for off-Standard Performance.
    a. Variance Analysis
    b. Variance Costing
    c. Variance Yield
    d. Variance Material
Chapter V

Budgeting and Budgetary Control

Aim
The aim of this chapter is to:

- introduce budgeting and budgetary control
- explicate the formula to calculate the expenses as per budget
- explain the objectives of budgetary control

Objectives
The objectives of this chapter are to:

- explain method of preparing flexible budget
- elucidate the concept of flexible budgeting
- define zero base budgeting

Learning outcome
At the end of this chapter, you will be able to:

- distinguish between forecast and budget
- understand classification of the budget on the basis of capacity, function and time
- identify the techniques of standard costing and budgetary control
5.1 Introduction

Budgeting has come to be accepted as an efficient method of short-term planning and control. It is employed, no doubt, in large business houses, but even the small businesses are using it at least in some informal manner. Through the budgets, a business wants to know clearly as to what it proposes to do during an accounting period or a part thereof. The technique of budgeting is an important application of Management Accounting. Probably, the greatest aid to good management that has ever been devised is the use of budgets and budgetary control. It is a versatile tool and has helped managers cope with many problems including inflation.

5.2 Definition of Budget

The Chartered Institute of Management Accountants, England, defines a ‘budget’ as under: “A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.” According to Brown and Howard of Management Accountant “a budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved.”

5.2.1 Essentials of a Budget

An analysis of the above said definitions reveal the following essentials of a budget:

- It is prepared for a definite future period.
- It is a statement prepared prior to a defined period of time.
- The Budget is monetary and I or quantitative statement of policy.
- The Budget is a predetermined statement and its purpose is to attain a given objective.

A budget, therefore, be taken as a document which is closely related to both the managerial as well as accounting functions of an organisation.

5.3 Forecast Vs Budget

Forecast is mainly concerned with an assessment of probable future events. Budget is a planned result that an enterprise aims to attain. Forecasting precedes preparation of a budget as it is an important part of the budgeting process. It is said that the budgetary process is more a test of forecasting skill than anything else. A budget is both a mechanism for profit planning and technique of operating cost control. In order to establish a budget it is essential to forecast various important variables like sales, selling prices, availability of materials, prices of materials, wage rates etc.

**Difference between Forecast and Budget**

Both budgets and forecasts refer to the anticipated actions and events. But still there are wide differences between budgets and forecasts as given below:

<table>
<thead>
<tr>
<th>Forecasts</th>
<th>Budgets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast is mainly concerned with anticipated or probable events</td>
<td>Budget is related to planned events</td>
</tr>
<tr>
<td>Forecasts may cover for longer period or years</td>
<td>Budget is planned or prepared for a shorter period</td>
</tr>
<tr>
<td>Forecast is only a tentative estimate</td>
<td>Budget is a target fixed for a period</td>
</tr>
<tr>
<td>Forecast results in planning</td>
<td>Result of planning is budgeting</td>
</tr>
<tr>
<td>The function of forecast ends with the forecast of likely events</td>
<td>The process of budget starts where forecast ends and converts it into a budget</td>
</tr>
<tr>
<td>Forecast usually covers a specific business function</td>
<td>Budget is prepared for the business as a whole</td>
</tr>
<tr>
<td>Forecasting does not act as a tool of controlling measurement</td>
<td>Purpose of budget is not merely a planning device but also a controlling tool</td>
</tr>
</tbody>
</table>

**Table 5.1 Difference between Forecast and Budget**
5.4 Budgetary Control

Budgetary Control is the process of establishment of budgets relating to various activities and comparing the budgeted figures with the actual performance for arriving at deviations, if any. Accordingly, there cannot be budgetary control without budgets. Budgetary Control is a system which uses budgets as a means of planning and controlling.

According to I.C.M.A. England Budgetary control is defined by Terminology as the establishment of budgets relating to the responsibilities of executives to the requirements of a policy and the continuous comparison of actual with the budgeted results, either to secure by individual actions the objectives of that policy or to provide a basis for its revision.

Brown and Howard defines budgetary control is “a system of controlling costs which includes the preparation of budgets, co-coordinating the department and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability.” The above definitions reveal the following essentials of budgetary control:

- Establishment of objectives for each function and section of the organisation.
- Comparison of actual performance with budget.
- Ascertainment of the causes for such deviations of actual from the budgeted performance.
- Taking suitable corrective action from different available alternatives to achieve the desired objectives.

5.4.1 Objectives of Budgetary Control

Budgetary Control is planned to assist the management for policy formulation, planning, controlling and co-coordinating the general objectives of budgetary control and can be stated in the following ways:

- Planning: A budget is a plan of action. Budgeting ensures a detailed plan of action for a business over a period of time.
- Co-ordination: Budgetary control co-ordinates the various activities of the entity or organisation and secure co-operation of all concerned towards the common goal.
- Control: Control is necessary to ensure that plans and objectives are being achieved. Control follows planning and co-ordination. No control performance is possible without predetermined standards. Thus, budgetary control makes control possible by continuous measures against predetermined targets. If there is any variation between the budgeted performance and the actual performance, the same is subject to analysis and corrective action.

5.4.2 Scope and Techniques of Standard Costing and Budgetary Control

Scope:

- Budgets are prepared for different functions of business such as production, sales etc. Actual results are compared with the budgets and control is exercised. Standards on the other hand are complied by classified, recording and allocation of the expenses to cost units. Actual costs are compared with standard costs.
- Budgets have a wide range of coverage of the entire organisation. Each operation or process is divided into number of elements and standards are set for each such element.
- Budgetary control is concerned with origin of expenditure at functional levels. Standard costing is concerned with the requirements of each element of cost.
- Budget is a projection of financial accounts whereas standard costing projects the cost accounts.

Technique:

- Budgetary control is exercised by putting budgets and actuals side by side. Variances are not normally revealed in the accounts. Standard costing variances are revealed through accounts.
- Budgetary control system can be operated in parts. For example, Advertisement Budgets, Research and Development Budgets, etc. Standard costing is not put into operation in parts.
- Budgetary control of expenses is broad in nature whereas standard costing system is a far more technically improved system by means of which the variances are analysed in detail.
5.4.3 Requisites for Effective Budgetary Control

The following are the requisites for effective budgetary control:

- Clear cut objectives and goals should be well defined
- The ultimate objective of realizing maximum benefits should always be kept uppermost.
- There should be a budget manual which contains all details regarding plan and procedures for its execution. It should also specify the time table for budget preparation for approval, details about responsibility, cost centres, etc.
- Budget committee should be set up for budget preparation and efficient execution of the plan.
- A budget should always be related to a specified time period
- Support of top management is necessary in order to get the full support and co-operation of the system of budgetary control
- To make budgetary control successful, there should be a proper delegation of authority and responsibility
- Adequate accounting system is essential to make the budgeting successful
- The employees should be properly educated about the benefits of budgeting system
- The budgeting system should not cost more to operate than it is worth
- Key factor or limiting factor, if any, should consider before preparation of budget
- For budgetary control to be effective, proper periodic reporting system should be introduced

5.5 Organisation for Budgetary Control

In order to introduce budgetary control system, the following are essential to be considered for a sound and efficient organisation. The important aspects to be considered are:

- Organisation chart
- Budget Centre
- Budget officer
- Budget committee
- Budget manual
- Budget period
- Key factor

5.5.1 Organisation Chart

For the purpose of effective budgetary control, it is imperative on the part of each entity to have definite “plan of organisation.” This plan of organisation is embodied in the organisation chart. The organisation chart explaining clearly the position of each executive’s authority and responsibility of the firm. All the functional heads are entrusted with the responsibility of ensuring proper implementation of their respective departmental budgets. An organisation chart for budgetary control is given showing clearly the type of budgets to be prepared by the functional heads.
From the above chart we can observe that the chairman of the company is the overall in charge of the functions of the budgeted committee. A budget officer is the convener of the budget committee, who helps in co-ordination. The purchase manager, production manager, sales manager, personnel manager, finance manager and account manager are made responsible to prepare their budgets.

5.5.2 Budget Centre
A Budget Centre is defined by the terminology as “a section of the organisation of an undertaking defined for the purpose of budgetary control.” For effective budgetary control budget centre or departments it should be established for each of which budget will be set with the help of the head of the department concerned.

5.5.3 Budget Officer
Budget officer is usually some senior member of the accounting staff who controls the budgetary process. He does not prepare the budget himself, but facilitates and co-ordinates the budgeting activity. He assists the individual departmental heads and the budget committee, and ensures that their decisions are communicated to the appropriate people.

5.5.4 Budget Committee
Budget committee comprises of the managing director, the production manager, sales manager and accountant. The main objectives of this committee are to agree on all departmental budgets, normal standard hours and allocations. In small concerns, the budget officer may co-ordinate the work for preparation and implementation of budgets. In large-scale concern a budget committee is setup for preparation of budgets and execution of budgetary control.

5.5.5 Budget Manual
A budget manual has been defined as “a document which set out the responsibilities of persons engaged in the routine of and the forms and records required for budgetary control.” It contains all details regarding the plan and procedures for its execution. It also specifies the time table for budget preparation to approval, details about responsibility, cost centres, constitution and organisation of budget committee, duties and responsibilities of budget officer.

5.5.6 Budget Period
A budget is always related to specified time period. The budget period is the length of time for which a budget is prepared and employed. The period may depend upon the type of budget. There is no specific period as such. However, for the sake of convenience, the budget period may be fixed depending upon the following factors:

- Types of business
- Types of budget
• Nature of the demand of the product
• Length of trade cycle
• Economic factors
• Availability of accounting period
• Availability of finance
• Control operation

5.6 Key Factor

Key Factor is also called as “Limiting Factor” or Governing Factor. While preparing the budget, it is necessary to consider key factor for successful budgetary control. The influence of the key factor dominates the business operations in order to ensure that the functional budgets are reasonably capable of fulfilment. The key factors include:

• Raw materials may be in short supply
• Non-availability of skilled labours
• Government restrictions
• Limited sales due to insufficient sales promotion
• Underutilisation of plant capacity
• Shortage of efficient executives
• Management policies regarding lack of capital
• Insufficient research into new product development
• Insufficiency due to shortage of space

5.6.1 Advantages of Budgetary Control

Following are the advantages of budgetary control

• It facilitates reduction of cost
• Budgetary control guides the management in planning and formulation of policies
• Budgetary control facilitates effective co-ordination of activities of the various departments and functions by setting their limits and goals
• It ensures maximisation of profits through cost control and optimum utilisation of resources
• It evaluates for the continuous review of performance of different budget centres.
• It helps to the management efficient and economic production control
• It facilitates corrective actions, whenever there are inefficiencies and weaknesses comparing actual performance with budget
• It guides management in research and development
• It helps to adopt the principles of standard costing

5.6.2 Limitations of Budgetary Control

Budgetary control is an effective tool for management control. However, it has few limitations which are identified below:

• The budget plan is based on estimates and forecasting. Forecasting cannot be considered to be an exact science. If the budget plans are made on the basis of inaccurate forecasts then the budget program may not be accurate and ineffective.
• For reasons of uncertainty about future, and changing circumstances which may develop later on, budget may prove short or excess of actual requirements.
• Effective implementation of budgetary control depends upon willingness, co-operation and understanding among people reasonable for execution. Lack of co-operation leads to inefficient performance.
The system does not substitute for management. It is simply like a management tool.

- Budgeting may be cumbersome and time consuming process.

5.7 Types of Budgets

As budgets serve different purposes, different types of budgets have been developed. The following are the different classification of budgets developed on the basis of time, functions, and flexibility or capacity. Following figure illustrates the types of budgets.

Types of Budget

- **On the basis of Time**
  - Long-Term Budget
  - Short-Term Budget
  - Current Budget

- **On the basis of Function**
  - Functional Budget
  - Master Budget

- **On the basis of Capacity**
  - Fixed Budget
  - Flexible Budget

Fig. 5.2 Types of budget

5.7.1 Classification on the Basis of Time

Following budgets are classified on basis of time:

- Long-term budgets: Long-term budgets are prepared for a longer period varies between five to ten years. It is usually developed by the top level management. These budgets summarise the general plan of operations and its expected consequences. Long-Term Budgets are prepared for important activities like composition of its capital expenditure, new product development and research, long-term finance, etc.

- Short-term budgets: These budgets are usually prepared for a period of one year. Sometimes they may be prepared for shorter period as for quarterly or half yearly. The scope of budgeting activity may vary considerably among different organisation.

- Current budgets: Current budgets are prepared for the current operations of the business. The planning period of a budget generally in months or weeks. As per ICMA London, “Current budget is a budget which is established for use over a short period of time and related to current conditions.”

5.7.2 Classification on the Basis of Function

Following budgets are classified on basis of function:

- Functional budget: The functional budget is one which relates to any of the functions of an organisation. The number of functional budgets depends upon the size and nature of business. The following are the commonly used:
  - Sales budget
  - Purchase budget
  - Production budget
  - Selling and distribution cost budget
  - Labour cost budget
  - Cash budget
  - Capital expenditure budget

- Master budget: The master budget is a summary budget. This budget encompasses all the functional activities into one harmonious unit. The ICMA England defines a Master Budget as the summary budget incorporating its functional budgets, which is finally approved, adopted and employed.
5.7.3 Classification on the Basis of Capacity

Following budgets are classified on basis of capacity:

- **Fixed budget**: A fixed budget is designed to remain unchanged irrespective of the level of activity actually attained.
- **Flexible budget**: A flexible budget is a budget which is designed to change in accordance with the various level of activity actually attained. The flexible budget also called as variable budget or sliding scale budget, takes both fixed, variable and semi fixed manufacturing costs into account.

### 5.8 Flexible Budget

Flexible budget is also called variable or sliding scale budget, “takes both the fixed and manufacturing costs into account. Flexible budget is the opposite of static budget showing the expected cost at a single level of activity. According to ICMA, England defined Flexible Budget is a budget which is designed to change in accordance with the level of activity actually attained.”

According to the principles that guide the preparation of the flexible budget a series of fixed budgets are drawn for different levels of activity. A flexible budget often shows the budgeted expenses against each item of cost corresponding to the different levels of activity. This budget has come into use for solving the problems caused by the application of the fixed budget.

#### 5.8.1 Advantages of Flexible Budget

Flexible budgeting has various advantages; some of them are listed below.

- In flexible budget, all possible volume of output or level of activity can be covered
- Overhead costs are analysed into fixed variable and semi-variable costs
- Expenditure can be forecasted at different levels of activity
- It facilitates at all times related factor can be compared which are essential for intelligent decision making
- A flexible budget can be prepared with standard costing or without standard costing depending upon what the company opts for
- Flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and quotations
- It helps in assessing the performance of all departmental heads as the same can be judged by terms of the level of activity attained by the business

<table>
<thead>
<tr>
<th>Fixed Budget</th>
<th>Flexible Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>It does not change with the volume of activity.</td>
<td>It can be recast on the basis of volume of cost.</td>
</tr>
<tr>
<td>All costs are related to one level of activity only.</td>
<td>Costs are analysed by behaviour and variable costs are allowed as per activity attained.</td>
</tr>
<tr>
<td>If budget and actual activity levels vary, cost ascertainment does not provide a correct picture.</td>
<td>Flexible budgeting helps in fixation of selling price at different levels of activity.</td>
</tr>
<tr>
<td>Ascertainment of costs is not possible in fixed cost.</td>
<td>Costs can be easily ascertained at different levels of activity.</td>
</tr>
<tr>
<td>It has a limited application for cost control.</td>
<td>It has more application and can be used as a tool for effective cost control.</td>
</tr>
<tr>
<td>It is rigid budget and drawn on the assumption that conditions would remain constant.</td>
<td>It is designed to change according to changed conditions.</td>
</tr>
<tr>
<td>Comparison of actual and budgeted performance cannot be done correctly because the volume of production differs.</td>
<td>Comparisons are realistic according to the change in the level of activity.</td>
</tr>
</tbody>
</table>
Costs are not classified according to their variability, i.e., fixed variable and semi-variable.

Costs are classified according to the nature of their variability.

Table 5.2 Distinction between Fixed Budget and Flexible Budget

5.9 Method of Preparing Flexible Budget
The following methods are used in preparing a flexible budget.

5.9.1 Multi-Activity Method
This method involves preparing a budget in response to different level of activity. The different level of activity or capacity levels are shown in horizontal columns, and the budgeted figures against such levels are placed in the vertical columns. The expenses involved in production as per budget are grouped as fixed, variable and semi variable.

5.9.2 Ratio Method
According to this method, the budget is prepared first showing the expected normal level of activity and the estimated variable cost per unit at the side expected level of activity in addition to the fixed cost as estimated. Therefore, the expenses as per budget, allowed for a particular level of activity attained, will be calculated on the basis of the following formula:

\[ \text{Budgeted fixed cost} + (\text{Variable cost per unit of activity} \times \text{Actual unit of activity}) \]

5.9.3 Charting Method
Under this method total expenses required for any level of activity, are estimated having classified into three categories, viz., Variable, Semi Variable and Fixed. These figures are plotted on a graph. The expenses are plotted on the Y-axis and the level of activity is plotted on X-axis. The graph would thus, help in ascertaining the quantum of budgeted expenses corresponding to the level of activity attained with the help of this chart.

5.10 Zero Base Budgeting (ZBB)
Zero base budgeting is a new technique of budgeting. It is designed to meet the needs of the management in order to ensure the operational efficiency and effective utilisation of the allocated resources of a concern. This technique was originally developed by Peter A. Phyhrhr, Manager of Taxas Instrument during 1969. This concept is widely used in USA for controlling their state expenditure when Mr. Jimmy Carter was the president of the USA. At present the technique has for its global recognition for many countries have implemented in real terms.

According to Peter A. Phyhrhr ZBB is defined as an “Operative Planning and Budgeting Process” which requires each Manager to justify his entire budget in detail from Scratch (hence zero base) and shifts the burden of proof to each manager to justify why we should spend any money at all.” In zero-base budgeting, a manager at all levels has to justify the importance of activity and to allocate the resources on priority basis.

5.10.1 Important Aspects of ZBB
Zero Base Budgeting involves the following important aspects:

- It emphasises on all requisites of budgets.
- Evaluation on the basis of decision packages and systematic analysis, i.e., in view of cost benefit analysis.
- Planning the activities promotes operational efficiency and monitors the performance to achieve the objectives.
5.10.2 Steps Involved in ZBB
The following are the steps involved in Zero Base Budgeting:
• No previous year performances of inefficiencies are to be taken as adjustments in subsequent year
• Identification of activities in decision packages
• Determination of budgeting objectives to be attained
• Extent to which Zero Base Budgeting is to be applied
• Evaluation of current and proposed expenditure and placing them in order of priority
• Assignment of task and allotment of sources on the basis of cost benefit comparison
• Review process of each activity examined afresh
• Weightage should be given for alternative course of actions

5.10.3 Advantages of ZBB
Various advantages of ZBB are listed below.
• Utilisation of resources at a maximum level
• It serves as a tool of management in formulating production planning
• It facilitates effective cost control
• It helps to identify the uneconomical activities
• It ensures the proper allocation of scarce resources on priority basis
• It helps to measure the operational inefficiencies and to take the corrective actions
• It ensures the principles of management by objectives
• It facilitates co-operation and co-ordination among all levels of management
• It ensures each activity is thoroughly examined on the basis of cost benefit analysis
Summary

• Budgeting has come to be accepted as an efficient method of short-term planning and control.
• The technique of budgeting is an important application of Management Accounting.
• According to Brown and Howard of Management Accountant “a budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved.
• Forecast is mainly concerned with an assessment of probable future events.
• Both budgets and forecasts refer to the anticipated actions and events.
• No control performance is possible without predetermined standards.
• Budgets have a wide range of coverage of the entire organisation.
• Key factor or limiting factor, if any, should consider before preparation of budget.
• For the purpose of effective budgetary control, it is imperative on the part of each entity to have definite “plan of organisation.”
• A Budget Officer is the convener of the budget committee, who helps in co-ordination.
• The Purchase Manager, Production Manager, Sales Manager, Personnel Manager, Finance Manager and Account Manager are made responsible to prepare their budgets.
• A budget is always related to specified time period.
• Key Factor is also called as “Limiting Factor” or Governing Factor.
• Budgetary control guides the management in planning and formulation of policies.
• Long-term budgets are prepared for a longer period varies between five to ten years.
• The number of functional budgets depends upon the size and nature of business.
• Flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and Quotations.
• Zero base budgeting is a new technique of budgeting.
• In zero-base budgeting, a manager at all levels has to justify the importance of activity and to allocate the resources on priority basis.
• ZBB ensures each activity is thoroughly examined on the basis of cost benefit analysis.

References

• Bhattacharyya, D., 2011. Management Accounting, Pearson Education India.
• Sherwani, N., Open-Silicon Design-Lite and Zero-Based Budgeting, [Video online] Available at: <http://www.youtube.com/watch?v=aEDZV_yoAFg> [Accessed 15 May 2013].

Recommended Reading

1. Which of the following definitions is given by the Chartered Institute of Management Accountants, England?
   a. A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.
   b. A system of controlling costs which includes the preparation of budgets, co-coordinating the department and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability.
   c. A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.
   d. A budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved.

2. ________ precedes preparation of a budget as it is an important part of the budgeting process.
   a. Budget
   b. Planning
   c. Forecasting
   d. Co-ordination

3. ________ control co-ordinates the various activities of the entity or organisation and secure co-operation of all concerned towards the common goal.
   a. Forecasting
   b. Budgetary
   c. Planning
   d. Budget factor

4. Match the following
   | 1. Forecasts            | A. Related to planned events |
   | 2. Budget              | B. It does not change with the volume of activity |
   | 3. Fixed Budget        | C. It can be recast on the basis of volume of cost |
   | 4. Flexible Budget     | D. Concerned with anticipated or probable events |
   a. 1-A, 2-C, 3-B, 4-D
   b. 1-B, 2-D, 3-C, 4-A
   c. 1-C, 2-B, 3-A, 4-D
   d. 1-D, 2-A, 3-B, 4-C

5. Which of the following statements is false?
   a. Overhead costs are analysed into fixed variable and semi-variable costs.
   b. Budgetary control guides the management in planning and formulation of policies.
   c. ZBB identifies activities in decision packages.
   d. ZBB helps to adopt the principles of standard costing.

6. Budgetary control is concerned with origin of expenditure at ________ levels.
   a. functional
   b. non-functional
   c. pause
   d. development
7. What is a plan of action?
   a. Forecasts
   b. Budget
   c. Control
   d. Charting

8. What is also called as Limiting Factor?
   a. Length of trade cycle
   b. Economic factors
   c. Key Factor
   d. Budget factor

9. Budget is classified on the basis of __________
   a. flexibility
   b. management
   c. costing
   d. period

10. Which of the followings is not a step involved in Zero Base Budgeting?
    a. Determination of budgeting objectives to be attained.
    b. Extent to which Zero Base Budgeting is to be applied.
    c. Review process of each activity examined afresh.
    d. Selling and distribution cost budget
Chapter VI

Capital Budgeting

Aim

The aim of this chapter is to:

• introduce the term capital budgeting
• explicate the methods for evaluating the capital investment proposals
• elucidate profitability index method and its rule of acceptance

Objectives

The objectives of this chapter are to:

• explain the formula for reciprocal pay-back period
• explicate principles or factors of capital budgeting decisions
• define capital budgeting

Learning outcome

At the end of this chapter, you will be able to:

• distinguish between traditional methods and discounted cash flow method
• understand importance of capital budgeting
• identify capital budgeting process
6.1 Introduction

The term Capital Budgeting refers to the long-term planning for proposed capital outlays or expenditure for the purpose of maximising return on investments. The capital expenditure may be:

- Cost of mechanization, automation and replacement.
- Cost of acquisition of fixed assets, e.g., land, building and machinery etc.
- Investment on research and development.
- Cost of development and expansion of existing and new projects.

6.2 Definition of Capital Budgeting

Capital Budget is also known as “Investment Decision Making or Capital Expenditure Decisions” or “Planning Capital Expenditure” etc. Normally such decisions where investment of money and expected benefits arising there from are spread over more than one year, it includes both rising of long-term funds as well as their utilisation. Charles T. Horngnen has defined capital budgeting as “Capital Budgeting is long term planning for making and financing proposed capital outlays.”

In other words, capital budgeting is the decision making process by which a firm evaluates the purchase of major fixed assets including building, machinery and equipment. According to Hamption, John. J., “Capital budgeting is concerned with the firm’s formal process for the acquisition and investment of capital.” From the above definitions, it may be concluded that capital budgeting relates to the evaluation of several alternative capital projects for the purpose of assessing those which have the highest rate of return on investment.

6.3 Importance of Capital Budgeting

Capital budgeting is important because of the following reasons:

- Capital budgeting decisions involve long-term implication for the firm, and influence its risk complexion.
- Capital budgeting involves commitment of large amount of funds.
- Capital decisions are required to assessment of future events which are uncertain.
- Wrong sale forecast; may lead to over or under investment of resources.
- In most cases, capital budgeting decisions are irreversible. This is because it is very difficult to find a market for the capital goods. The only alternative available is to scrap the asset, and incur heavy loss.
- Capital budgeting ensures the selection of right source of finance at the right time.
- Many firms fail, because they have too much or too little capital equipment.
- Investment decision taken by individual concern is of national importance because it determines employment, economic activities and economic growth.

6.4 Objectives of Capital Budgeting

The following are the important objectives of capital budgeting:

- To ensure the selection of the possible profitable capital projects.
- To ensure the effective control of capital expenditure in order to achieve by forecasting the long-term financial requirements.
- To make estimation of capital expenditure during the budget period and to see that the benefits and costs may be measured in terms of cash flow.
- Determining the required quantum takes place as per authorisation and sanctions.
- To facilitate co-ordination of inter-departmental project funds among the competing capital projects.
- To ensure maximisation of profit by allocating the available investible.
6.5 Principles or Factors of Capital Budgeting Decisions
A decision regarding investment or a capital budgeting decision involves the following principles or factors:

- A careful estimate of the amount to be invested.
- Creative search for profitable opportunities.
- Careful estimates of revenues to be earned and costs to be incurred in future in respect of the project under consideration.
- A listing and consideration of non-monetary factors influencing the decisions.
- Evaluation of various proposals in order of priority having regard to the amount available for investment.
- Proposals should be controlled in order to avoid costly delays and cost over-runs.
- Evaluation of actual results achieved against those budget.
- Care should be taken to think all the implication of long range capital investment and working capital requirements.
- It should recognise the fact that bigger benefits are preferable to smaller ones and early benefits are preferable to latter benefits.

6.6 Capital Budgeting Process
The following procedure may be considered in the process of capital budgeting decisions:

- Identification of profitable investment proposals
- Screening and selection of right proposals
- Evaluation of measures of investment worth on the basis of profitability and uncertainty or risk
- Establishing priorities, i.e., uneconomical or unprofitable proposals may be rejected.
- Final approval and preparation of capital expenditure budget
- Implementing proposal, i.e., project execution
- Review the performance of projects

6.7 Types of Capital Expenditure
Capital Expenditure can be of two types:

- Capital expenditure increases revenue
- Capital expenditure reduces costs

Capital Expenditure Increases Revenue: It is the expenditure which brings more revenue to the firm either by expanding the existing production facilities or development of new production line.

Capital Expenditure Reduces Costs: Such a capital expenditure reduces the cost of present product and thereby increases the profitability of existing operations. It can be done by replacement of old machine by a new one.

6.8 Types of Capital Budgeting Proposals
A firm may have several investment proposals for its consideration. It may adopt after considering the merits and demerits of each one of them. For this purpose capital expenditure proposals may be classified into:

- Independent Proposals
- Dependent Proposals or Contingent Proposals
- Mutually Exclusive Proposals

Independent Proposals: These proposals are said to be economically independent which are accepted or rejected on the basis of minimum return on investment required. Independent proposals do not depend upon each other.
Dependent Proposals or Contingent Proposals: In this case, when the acceptance of one proposal is contingent upon the acceptance of other proposals, it is called as “Dependent or Contingent Proposals.” For example; construction of new building on account of installation of new plant and machinery describes it.

Mutually Exclusive Proposals: Mutually Exclusive Proposals refer to the acceptance of one proposal results in the automatic rejection of the other proposal. Then the two investments are mutually exclusive. In other words, one can be rejected and the other can be accepted. It is easier for a firm to take capital budgeting decisions on such projects.

6.9 Methods of Evaluating Capital Investment Proposals
There are number of appraisal methods which may be recommended for evaluating the capital investment proposals. We shall discuss the most widely accepted methods. These methods can be grouped into the following categories:

Traditional Methods
Traditional methods are grouped in to the following:

- Pay-back period method or Payout method
- Improvement of Traditional Approach to Pay-back Period Method
  - Post Pay-back profitability Method
  - Discounted Pay-back Period Method
  - Reciprocal Pay-back Period Method
- Rate of Return Method or Accounting Rate of Return Method

Time Adjusted Method or Discounted Cash Flow Method
Time Adjusted Method further classified into:

- Net Present Value Method
- Internal Rate of Return Method
- Profitability Index Method

6.9.1 Traditional Methods
Pay-back Period Method: Pay-back period is also termed as “Pay-out period” or Pay-off period. Pay out Period Method is one of the most popular and widely recognised traditional methods of evaluating investment proposals. It is defined as the number of years required to recover the initial investment in full with the help of the stream of annual cash flows generated by the project. Calculation of Pay-back Period: Pay-back period can be calculated into the following two different situations:

- In the case of constant annual cash inflows.
- In the case of uneven or unequal cash inflows.

In the case of constant annual cash inflows: If the project generates constant cash flow the Pay-back period can be computed by dividing cash outlays (original investment) by annual cash inflows. The following formula can be used to ascertain pay-back period:

\[
\text{Pay-back Period} = \frac{\text{Cash Outlays (Initial Investment)}}{\text{Annual Cash Inflows}}
\]

Example 1:
A project requires initial investment of Rs. 40,000 and it will generate an annual cash inflow of Rs. 10,000 for 6 years. You are required to find out pay-back period.
Solution:
Calculation of Pay-back period:

\[
\text{Pay-back Period} = \frac{\text{Cash Outlays (Initial Investment)}}{\text{Annual Cash Inflows}}
\]

\[
\begin{align*}
\text{Rs. 40,000} & \quad \text{Rs. 10,000} \\
= & \quad = \\
\text{4 years} & \quad \text{years}
\end{align*}
\]

Pay-back period is 4 years, i.e., the investment is fully recovered in 4 years.

Example 2: In the case of Uneven or Unequal Cash Inflows
In the case of uneven or unequal cash inflows, the Pay-back period is determined with the help of cumulative cash inflow. It can be calculated by adding up the cash inflows until the total is equal to the initial investment.

From the following information you are required to calculate pay-back period:
A project requires initial investment of Rs. 40,000 and generates cash inflows of Rs. 16,000, Rs. 14,000, Rs. 8,000 and Rs. 6,000 in the first, second, third, and fourth year respectively.

Solution:
Calculation Pay-back Period with the help of “Cumulative Cash Inflows”

\[
\begin{array}{|c|c|c|}
\hline
\text{Year} & \text{Annual Cash Inflows Rs.} & \text{Cumulative Cash Inflows Rs.} \\
\hline
1 & 16,000 & 16,000 \\
2 & 14,000 & 30,000 \\
3 & 8,000 & 38,000 \\
4 & 6,000 & 44,000 \\
\hline
\end{array}
\]

The above table shows that at the end of 4th years the cumulative cash inflows exceeds the investment of Rs. 40,000. Thus the pay-back period is as follows:

\[
\text{Pay-back Period} = 3 \text{ Years} + \frac{40,000 - 38,000}{6,000} \\
\text{= 3 Years} + \frac{\text{Rs. 2,000}}{\text{Rs. 6,000}} \\
\text{= 3.33 Years}
\]

Accept or Reject Criterion
Investment decisions based on pay-back period are used by many firms to accept or reject an investment proposal. Among the mutually exclusive or alternative projects whose pay-back periods are lower than the cut off period, the project would be accepted, if not it would be rejected.

Advantages of Pay-back Period Method
- It is an important guide to investment policy.
- It is simple to understand and easy to calculate.
- It facilitates to determine the liquidity and solvency of a firm.
- It helps to measure the profitable internal investment opportunities.
- It enables the firm to select an investment which yields a quick return on cash funds.
- It used as a method of ranking competitive projects.
- It ensures reduction of cost of capital expenditure.
Disadvantages or Pay-back Period Method

- It does not measure the profitability of a project
- It does not value projects of different economic lives
- This method does not consider income beyond the pay-back period
- It does not give proper weight to timing of cash flows
- It does not indicate how to maximise value and ignores the relative profitability of the project
- It does not consider cost of capital and interest factor which are very important factors in taking sound investment decisions.

6.9.2 Improvement of Traditional Approach to Pay-back Period

The demerits of the pay-back period method may be eliminated in the following ways:

(a) Post Pay-back Profitability Method

One of the limitations of the pay-back period method is that it ignores the post pay-back returns of project. To rectify the defect, post pay-back period method considers the amount of profits earned after the pay-back period. This method is also known as Surplus Life over Payback Method. According to this method, pay-back profitability is calculated by annual cash inflows in each of the year, after the pay-back period. This can be expressed in percentage of investment.

Post Pay-back Profitability = Annual Cash Inflow x (Estimated Life - Pay-back Period)

The post pay-back profitability index can be determined by the following equation:

Post Pay-back Profitability Index = \frac{Post Pay-back Profitability}{Initial Investments} \times 100

(b) Discounted Pay-back Method

This method is designed to overcome the limitation of the payback period method. When savings are not leveled, it is better to calculate the pay-back period by taking into consideration the present value of cash inflows. Discounted pay-back method helps to measure the present value of all cash inflows and outflows at an appropriate discount rate. The time period at which the cumulated present value of cash inflows equals the present value of cash outflows is known as discounted pay-back period.

(c) Reciprocal Pay-back Period Method

This methods helps to measure the expected rate of return of income generated by a project Reciprocal pay-back period method is a close approximation of the Time Adjusted Rate of Return, if the earnings are leveled and the estimated life of the project is somewhat more than twice the pay-back period. This can be calculated by the following formula:

Reciprocal Pay-back Period = \frac{Annual Cash Inflows}{Total Investment} \times 100

Example 3:
The company is considering investment of Rs. 1, 00,000 in a project. The following are the income forecasts, after depreciation and tax, 1st year Rs. 10,000, 2nd year Rs. 40,000, 3rd year Rs. 60,000, 4th year Rs. 20,000 and 5th year Rs. Nil. From the above information you are required to calculate: (1) Pay-back Period (2) Discounted Pay-back Period at 10% interest factor.

Solution:

(1) Calculation of Pay-back Period

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Cash Inflows Rs.</th>
<th>Cumulative Cash Inflows Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>2</td>
<td>40,000</td>
<td>50,000</td>
</tr>
</tbody>
</table>
The above table shows that at the end of 3rd year the Cumulative Cash Inflows exceeds the investment of Rs. 1, 00,000. Thus the Pay-back Period is as follows:

\[
\text{Pay-back Period} = 2 \text{ Years} + \frac{1,00,000 - 50,000}{60,000} \\
= 2 \text{ Years} + \frac{\text{Rs.}50,000}{\text{Rs.}60,000} \\
= 2 \text{ Years} + 0.833 = 2.833 \text{ Years}
\]

(2) Calculation of Discounted Pay-back Period 10% Interest Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Inflows</th>
<th>Discounting Present Value Factor at 10%</th>
<th>Present Value of Cash Inflows (Z x3)</th>
<th>Cumulative Value of Cash Inflows Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10,000</td>
<td>0.9091</td>
<td>9,091</td>
<td>9.091</td>
</tr>
<tr>
<td>2</td>
<td>40,000</td>
<td>0.8265</td>
<td>33,060</td>
<td>42,151</td>
</tr>
<tr>
<td>3</td>
<td>60,000</td>
<td>0.7513</td>
<td>45,078</td>
<td>87,229</td>
</tr>
<tr>
<td>4</td>
<td>20,000</td>
<td>0.6830</td>
<td>13,660</td>
<td>1,00,889</td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>0.6209</td>
<td>--</td>
<td>1,00,889</td>
</tr>
</tbody>
</table>

From the above table, it is observed that up to the 4th year Rs. 1, 00,000 is recovered. Because the Discounting Cumulative Cash Inflows exceeds the original cash outlays of Rs. 1, 00,000. Thus the Discounted Pay-back Period is calculated as follows:

\[
\text{Pay-back Period} = 3 \text{ Years} + \frac{1,00,000 - 87.229}{13.660} \\
= 3 \text{ Years} + \frac{12,771}{13.660} \\
= 3 \text{ Years} + 0.935 = 3.935 \text{ Years}
\]

6.9.3 Average Rate of Return Method (ARR) or Accounting Rate of Return Method

Average Rate of Return Method is also termed as Accounting Rate of Return Method. This method focuses on the average net income generated in a project in relation to the project’s average investment outlay. This method involves accounting profits not cash flows and is similar to the performance measure of return on capital employed. The average rate of return can be determined by the following equation:

\[
\text{Average Rate of Return (ARR)} = \frac{\text{Average Income}}{\text{Average Investments}} \times 100
\]

\[
= \frac{\text{Cash Flow - (After Depreciation and Tax)}}{\text{Original Investments}} \times \frac{\text{No. of Projects}}{\text{No. of Years}} \times 100
\]
Where,
Average investment would be equal to the Original investment plus salvage value divided by 2.

\[
\text{Average Investment} = \frac{\text{Original Investment}}{2} \quad \text{(or)} \quad \frac{\text{Original Investment} - \text{Scrap Value of the Project}}{2}
\]

Advantages
- It considers all the years involved in the life of a project rather than only pay-back years
- It applies accounting profit as a criterion of measurement and not cash flow

Disadvantages
- It applies profit as a measure of yardstick not cash flow
- The time value of money is ignored in this method
- Yearly profit determination may be a difficult task

6.9.4 Discounted Cash Flow Method (or) Time Adjusted Method

Discount cash flow is a method of capital investment appraisal which takes into account both the overall profitability of projects and also the timing of return. Discounted cash flow method helps to measure the cash inflow and outflow of a project as if they occurred at a single point in time so that they can be compared in an appropriate way. This method recognises that the use of money has a cost, i.e., interest foregone. In this method risk can be incorporated into Discounted Cash Flow computations by adjusting the discount rate or cut off rate.

Disadvantages
The following are some of the limitations of Discounted Pay-back Period Method:
- There may be difficulty in accurately establishing rates of interest over the cash flow period.
- Lack of adequate expertise in order to properly apply the techniques and interpret results.
- These techniques are based on cash flows, whereas reported earnings are based on profits.

The inclusion of Discounted Cash Flow Analysis may cause projected earnings to fluctuate considerably and thus have an adverse on share prices.

6.9.5 Net Present Value Method (NPV)

This is one of the Discounted Cash Flow techniques which explicitly recognise the time value of money. In this method all cash inflows and outflows are converted into present value (i.e., value at the present time) applying an appropriate rate of interest (usually cost of capital).

In other words, Net Present Value Method discount inflows and outflows to their present value at the appropriate cost of capital and set the present value of cash inflow against the present value of outflow to calculate Net Present Value. Thus, the Net Present Value is obtained by subtracting the present value of cash outflows from the present value of cash inflows.

Advantages of Net Present Value Method
- It recognises the time value of money and is thus scientific in its approach.
- All the cash flows spread over the entire life of the project are used for calculations.
- It is consistent with the objectives of maximising the welfare of the owners as it depicts the positive or otherwise present value of the proposals.
Disadvantages

- This method is comparatively difficult to understand or use.
- When the projects in consideration involve different amounts of investment, the Net Present Value Method may not give satisfactory results.

6.9.6 Internal Rate of Return Method (IRR)

Internal Rate of Return Method is also called as “Time Adjusted Rate of Return Method.” It is defined as the rate which equates the present value of each cash inflows with the present value of cash outflows of an investment. In other words, it is the rate at which the net present value of the investment is zero.

Horngren and Foster define Internal Rate of Return as the rate of interest at which the present value of expected cash inflows from a project equals the present value of expected cash outflows of the project. The Internal Rate of Return can be found out by Trial and Error Method. First, compute the present value of the cash flow from an investment, using an arbitrarily selected interest rate, for example 10%. Then compare the present value so obtained with the investment cost.

If the present value is higher than the cost of capital, try a higher interest rate and go through the procedure again. On the other hand if the calculated present value of the expected cash inflows is lower than the present value of cash outflows a lower rate should be tried. This process will be repeated until and unless the Net Present Value becomes zero. The interest rate that brings about this equality is defined as the Internal Rate of Return.

Alternatively, the internal rate can be obtained by Interpolation Method when we come across two rates; one with positive net present value and other with negative net present value. The IRR is considered as the highest rate of interest which a business is able to pay on the funds borrowed to finance the project out of cash inflows generated by the project. The Interpolation formula can be used to measure the Internal Rate of Return as follows:

$$\text{Internal Rate of Return} = \text{Lower Interest Rate} + \frac{\text{NPV of Lower Rate}}{\text{NPV Lower Rate} - \text{NPV Higher Rate}} \times (\text{higher rate} - \text{lower rate})$$

Evaluation

A popular discounted cash flow method, the internal rate of return criterion has several virtues:

- It takes into account the time value of money.
- It considers the cash flows over the entire life of the project.
- It makes more meaningful and acceptable to users because it satisfies them in terms of the rate of return on capital.

Limitations

- The internal rate of return may not be uniquely defined.
- The IRR is difficult to understand and involves complicated computational problems.
- The internal rate of return figure cannot distinguish between lending and borrowings and hence high internal rate of return need not necessarily be a desirable feature.

6.9.7 Profitability Index Method

Profitability Index is also known as Benefit Cost Ratio. It gives the present value of future benefits, computed at the required rate of return on the initial investment. Profitability Index may either be Gross Profitability Index or Net Profitability Index. Net Profitability Index is the Gross Profitability Index minus one. The Profitability Index can be calculated by the following equation:

$$\text{Profitability Index} = \frac{\text{Present Value of Cash Inflows}}{\text{Initial Cash Outlays}}$$
Rule of Acceptance
As per the Benefit Cost Ratio or Profitability Index a project with Profitability Index greater than one should be accepted as it will have Positive Net Present Value. Likewise if Profitability Index is less than one the project is not beneficial and should not be accepted.

Advantages of Profitability Index:
• It duly recognises the time value of money.
• For calculations when compared with internal rate of return method it requires less time.
• It helps in ranking the project for investment decisions.
• As this method is capable of calculating incremental benefit cost ratio, it can be used to choose between mutually exclusive projects.
Summary

- The term Capital Budgeting refers to the long-term planning for proposed capital outlays or expenditure for the purpose of maximising return on investments.
- Capital Budget is also known as “Investment Decision Making or Capital Expenditure Decisions” or “Planning Capital Expenditure” etc.
- According to Hamption, John. J., “Capital budgeting is concerned with the firm’s formal process for the acquisition and investment of capital.”
- Capital budgeting decisions involve long-term implication for the firm, and influence its risk complexion.
- Investment decision taken by individual concern is of national importance because it determines employment, economic activities and economic growth.
- Capital Expenditure Increases Revenue is the expenditure which brings more revenue to the firm either by expanding the existing production facilities or development of new production line.
- A firm may have several investment proposals for its consideration.
- There are number of appraisal methods which may be recommended for evaluating the capital investment proposals.
- Pay-back period is also termed as “Pay-out period” or Pay-off period.
- One of the limitations of the pay-back period method is that it ignores the post pay-back returns of project.
- Discounted pay-back method helps to measure the present value of all cash inflows and outflows at an appropriate discount rate.
- Average Rate of Return Method is also termed as Accounting Rate of Return Method.
- Discount cash flow is a method of capital investment appraisal which takes into account both the overall profitability of projects and also the timing of return.
- Net Present Value is obtained by subtracting the present value of cash outflows from the present value of cash inflows.
- Internal Rate of Return Method is also called as “Time Adjusted Rate of Return Method.
- Horngren and Foster define Internal Rate of Return as the rate of interest at which the present value of expected cash inflows from a project equals the present value of expected cash outflows of the project.
- Profitability Index is also known as Benefit Cost Ratio.
- As per the Benefit Cost Ratio or Profitability Index a project with Profitability Index greater than one should be accepted as it will have Positive Net Present Value.

Reference

- Irfanullah, A., 2011. CFA Level I Capital Budgeting Video Lecture by Mr. Arif Irfanullah part 2 [Video online] Available at: <http://www.youtube.com/watch?v=qfzQwqLdXH0> [Accessed 16 May 2013].
- Capital Budgeting [Video online] Available at: <http://www.youtube.com/watch?v=qGgVGUcBqAg> [Accessed 16 May 2013].
Recommended Reading


Self Assessment

1. ________ is concerned with the firm’s formal process for the acquisition and investment of capital.
   a. Investment
   b. Capital budgeting
   c. Capital expenditure
   d. Planning

2. Which of the following statements is false?
   a. Capital budgeting involves commitment of small amount of funds.
   b. Wrong sale forecast; may lead to over or under investment of resources.
   c. Many firms fail, because they have too much or too little capital equipment.
   d. Capital decisions are required to assessment of future events which are uncertain.

3. ___________ is the expenditure which brings more revenue to the firm either by expanding the existing production facilities or development of new production line.
   a. Mutually Exclusive Proposals
   b. Independent Proposals
   c. Capital Expenditure Increases Revenue
   d. Capital Expenditure Reduces Costs

4. What reduces the cost of present product and thereby increases the profitability of existing operations?
   a. Mutually Exclusive Proposals
   b. Independent Proposals
   c. Capital Expenditure Increases Revenue
   d. Capital Expenditure Reduces Costs

5. ___________ refer to the acceptance of one proposal results in the automatic rejection of the other proposal.
   a. Mutually Exclusive Proposals
   b. Dependent Proposals
   c. Contingent Proposals
   d. Independent Proposals

6. Which proposals are said be to economically independent?
   a. Mutually Exclusive Proposals
   b. Independent Proposals
   c. Dependent Proposals
   d. Contingent Proposals

7. Which of the following formula calculates Profitability Index?
   a. Average Rate of Return (ARR) = \( \frac{\text{Average Income}}{\text{Average Investments}} \times 100 \)
   b. Lower Interest Rate + \( \frac{\text{NPV of Lower Rate}}{\text{NPV Lower Rate} - \text{NPV Higher Rate}} \) \times (higher rate – lower rate)
   c. Reciprocal Pay-back Period = \( \frac{\text{Annual Cash Inflows}}{\text{Total Investment}} \times 100 \)
   d. Profitability Index = \( \frac{\text{Present Value of Cash Inflows}}{\text{Initial Cash Outlays}} \)
8. ____________ is defined as the number of years required to recover the initial investment in full with the help of the stream of annual cash flows generated by the project.
   a. Profitability Index Method
   b. Internal Rate of Return Method
   c. Pay out Period Method
   d. Net Present Value Method

9. If the project generates constant cash flow the pay-back period can be computed by dividing __________ by annual cash inflows.
   a. constant annual cash inflows
   b. investment proposals
   c. cash inflows
   d. cash outlays

10. __________ is a method of capital investment appraisal which takes into account both the overall profitability of projects and also the timing of return.
    a. Discount cash flow
    b. Cash flow
    c. Net present value method
    d. Internal rate of return method
Chapter VII
Methods of Costing

Aim
The aim of this chapter is to:

• explain various methods of costing
• elucidate objectives of job costing
• explicate process costing

Objectives
The objectives of this chapter are to:

• compare job and process costing
• enlist the methods of job costing
• explain batch costing

Learning outcome
At the end of this chapter, you will be able to:

• define job costing
• understand job costing procedure
• identify the various types of cost management
7.1 Introduction

The term ‘methods’ and ‘systems’ are used synonymously to indicate an integrated set of procedures based on a complex concept of ideas, principles and concepts. The term method of costing refers to cost ascertainment. Different methods of costing for different industries depend upon the production activities and the nature of business. For these, costing methods can be grouped into two broad categories:

- Job costing
- Process costing

7.2 Job costing

Job costing (or job order costing) is a method of cost ascertainment used in job order industries. Special features of such industries are as follows:

- Production is against customer’s orders and not for stocks
- Each job has its own characteristics and requires special attention
- The flow of production from one department to another is not uniform

It is the nature of job which determines the department through which it is to be processed. Job costing is applied to such industries as printing work, motor car repair, machine tools, general engineering, interior decoration, etc.

7.2.1 Objectives of job costing

The following are the main objectives of job costing:

- Cost of each job/order is ascertained separately. This helps in finding out the profit or loss on each individual job.
- It enables management to detect those jobs which are more profitable and those which are unprofitable.
- It provides a basis for determining the cost of similar jobs undertaken in future. It thus helps in future production planning.
- It helps management in controlling costs by comparing the actual costs with the estimated costs.

7.2.2 Job costing procedure

The following steps are taken in job costing:

- Job number: When an order has been accepted, an individual job number must be assigned to each such job so that separate jobs are identifiable at all stages of production. Assignment of job numbers also facilitates reference for costing purposes in the ledger and is conveniently short for use on various forms and documents.
- Production order: The Production Control Department then makes out a Production Order thereby authorising to start work on the job. Several copies of production order are prepared, the copies often being in different colours to distinguish them more easily. These copies are passed on to the following:
  - All departmental foremen concerned with the job
  - Storekeeper for issuance of materials
  - Tool room for an advance notification of tools required

Proforma of a Production Order is given in Fig. 7.1. The columns provided in the production order differ widely, depending largely upon the nature of production. Sometimes orders are accompanied by the blue prints and contain a bill of materials and detailed instructions as to which tools and machinery are to be used.

- Job cost sheet. The unique accounting document under job costing is the job cost sheet. Receipt of production order is the signal for the cost accountant to prepare a job cost sheet on which he will record the cost of materials used and the labour and machine time taken. Each concern has to design a job cost sheet to suit its needs. A simple proforma of job cost sheet is given in ‘Fig. 7.2.'
Job cost sheets are not prepared for specified periods but they are made out for each job regardless of the time taken for its completion. However, material, labour and overhead costs are posted periodically to the relevant cost sheet. The material, labour and overhead to be absorbed into jobs are collected and recorded in the following way:

**Direct materials**

The method of recording receipts and issues of materials on materials requisitions or bill of materials was explained in detail in chapter on Materials. It may be recalled that material requisitions or bill of materials show the quantities of materials issued to jobs from store. When copies of these documents reach the cost office, they are priced and entered in the stores ledger account in the “Issues” column. Each requisition shows the job number to which the material is to be charged. Summaries of material requisitions are prepared at regular intervals on Materials Abstract. These summaries facilitate debiting the job with total cost of materials rather than charging with many small items.
**Direct wages**
The wages payable to workers are calculated on clock cards, job cards, time sheets, etc. The summaries of job cards are made on wages abstract or wages analysis sheets, which shows the direct wages chargeable to each job. The total of wages chargeable to various jobs is debited to work-in-progress control account.

**Direct expenses**
Direct expenses which can be identified with specific jobs are directly charged to Completion of jobs. When jobs are completed, the cost is transferred to cost of sales account.

**Overheads**
Indirect materials, indirect wages and indirect expenses which cannot be identified with specific jobs are apportioned to cost centers. Absorption of overhead by the jobs passing through the cost centers is based upon percentage of direct wages or direct material cost, direct labour hours or machine hours, etc. These methods of absorption have also been discussed in detail in the chapter on Overheads.

The direct materials, wages and expenses and the overheads absorbed are totaled to give the total cost.

**Completion of Jobs**
When jobs are completed, the cost is transferred to cost of sales account. The total cost of jobs completed during each period is set against the sales to determine the profit or loss for the period.

**7.2.3 Methods of Job Costing**
Job costing is further classified into:
- Contract costing
- Cost plus contract
- Batch costing

**Contract costing**
This method of costing is applicable where the job work is big like contract work of building. Under this method, costs are collected according to each contract work. Contract costing is also termed as Terminal Costing. The principles of job costing are applied in contract costing.

**Cost plus contract**
These contracts provide for the payment by the contractee of the actual cost of manufacture plus a stipulated profit. The profit to be added to the cost. It may be a fixed amount or it may be a stipulated percentage of cost. These contracts are generally entered into when at the time of undertaking of a work, it is not possible to estimate its cost with reasonable accuracy due to unstable condition of material, labour etc. or when the work is spread over a long period of time and prices of materials, rates of labour etc. are liable to fluctuate.

**Batch costing**
In Batch Costing, a lot of similar units which comprise the batch may be used as a cost unit for ascertainment of cost. Separate Cost Sheet is maintained for each batch by assigning a batch number. Cost per unit of product is determined by dividing the total cost of a batch by the number of units of the batch. Batch Costing is used in drug industries, ready-made garments industries, electronic components manufacturing, T V Sets, etc.

In many industries, for manufacturing a product, the raw material has to pass through several distinct stages of manufacture in a pre-determined sequence. Each such stage of manufacture is called a ‘process’. The goods produced are identical and all factory processes are standardised. Method of cost ascertainment in such industries is known as process costing in which costs are compiled for each process by preparing a separate account of each process.
7.3 Process Costing

In many industries, for manufacturing a product, the raw material has to pass through several distinct stages of manufacture in a pre-determined sequence. Each such stage of manufacture is called a ‘process’. The goods produced are identical and all factory processes are standardised. Method of cost ascertainment in such industries is known as process costing in which costs are compiled for each process by preparing a separate account of each process.

7.3.1 Characteristics of Process Costing

Following are the characteristics of process costing:

- The production is continuous and the final product is the result of a sequence of processes.
- Costs are accumulated by processes.
- The products are standardised and homogeneous.
- The cost per unit produced is the average cost which is calculated by dividing the total process cost by the number of units produced.
- The finished product of each but last process becomes the input for the next process in sequence and that of the last process is transferred to the finished goods stock.
- The sequence of operations or processes is specific and pre-determined.
- Some loss of materials in processes (due to chemical action, evaporation, etc.) is unavoidable.
- Processing of raw materials may give rise to the production of several products. These several products produced from the same raw material may be termed as joint products or by-products.

Process costing is used in:

- Textiles mills
- Sugar industry
- Chemical industry
- Oil refining
- Cement industry
- Paper industry
- Food processing
- Steel industry
- Paint industry
- Soap industry
- Bakery

7.3.2 Process Costing and Job Costing - A Comparison

A comparison of process and job costing methods will help in the better understanding of process costing system.

<table>
<thead>
<tr>
<th>Process Costing</th>
<th>Job costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs are compiled process-wise and cost per unit is the average cost, i.e., the total cost of the process divided by the number of units produced.</td>
<td>Costs are separately ascertained for each job, which is cost unit.</td>
</tr>
<tr>
<td>Production is of standardized products and cost units are identical.</td>
<td>Production is of non-standard items with specifications and instructions from the customers.</td>
</tr>
<tr>
<td>Production is for stocks.</td>
<td>Production is against orders from customers.</td>
</tr>
<tr>
<td>Costs are computed at the end of a specific period.</td>
<td>Costs are calculated when a job is completed.</td>
</tr>
<tr>
<td>The cost of one process is transferred to the next process in the sequence.</td>
<td>Cost of a job is not transferred to another job but to finished stock amount.</td>
</tr>
</tbody>
</table>
On account of continuous nature of production, work in progress in the beginning and end of the accounting period is a regular feature. There may or may not be work in progress in the beginning and end of the accounting period.

Cost control is comparatively easier. This is because factory process and products are standardised.

Cost control is comparatively more difficult because each cost unit or job needs individual attention.

<table>
<thead>
<tr>
<th>Table 7.1 Comparison between job costing and process costing</th>
</tr>
</thead>
</table>

7.3.3 Process Costing Procedure

The essential stages in process costing procedure are as follows:

- The factory is divided into a number of processes and an account is maintained for each process. Each process account is debited with material cost, labour cost, direct expenses and overheads allocated or apportioned to the process.
- The output of a process is transferred to the next process in the sequence. In other words, finished output of one process becomes input of the next process.
- The finished output of the last process (i.e. the final product) is transferred to the Finished Goods Account.

![Fig. 7.3 Process costing procedure](image)

Prepare process accounts and calculate total cost of production from the data given below:

<table>
<thead>
<tr>
<th>Process X</th>
<th>Process Y</th>
<th>Process Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs.</td>
<td>Rs.</td>
<td>Rs.</td>
</tr>
<tr>
<td>Materials</td>
<td>abour</td>
<td>abour</td>
</tr>
<tr>
<td>2,250</td>
<td>750</td>
<td>300</td>
</tr>
<tr>
<td>1,200</td>
<td>3,000</td>
<td>900</td>
</tr>
<tr>
<td>Direct expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>Carriage</td>
<td>Works overhead</td>
</tr>
<tr>
<td>300</td>
<td>200</td>
<td>1,890</td>
</tr>
<tr>
<td>200</td>
<td>300</td>
<td>2,500</td>
</tr>
</tbody>
</table>

The direct expenses Rs. 1,275 should be apportioned on the basis of wages.

**Solution:**

<table>
<thead>
<tr>
<th>Process X Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs.</td>
</tr>
<tr>
<td>To materials</td>
</tr>
<tr>
<td>To Labour</td>
</tr>
<tr>
<td>To Direct expenses:</td>
</tr>
<tr>
<td>Fuel</td>
</tr>
<tr>
<td>Carriage</td>
</tr>
<tr>
<td>To Works overhead</td>
</tr>
<tr>
<td>To Indirect expenses</td>
</tr>
<tr>
<td>6,140</td>
</tr>
</tbody>
</table>
### Process Y Account

<table>
<thead>
<tr>
<th>Description</th>
<th>Rs.</th>
<th>By Tr. to process Z</th>
<th>Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Tr. from Process X To</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>6,140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Labour</td>
<td>750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Direct expenses:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>3,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carriage</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Works overhead</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Indirect expenses</td>
<td>2,580</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>750</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13,720</td>
<td></td>
<td>13,720</td>
</tr>
</tbody>
</table>

### Process Z Account

<table>
<thead>
<tr>
<th>Description</th>
<th>Rs.</th>
<th>By Transfer to Finished Goods</th>
<th>Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Tr. from Process Y To</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>13,720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Labour</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Direct expenses:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carriage</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Works overhead</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Indirect expenses</td>
<td>1,875</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>225</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17,520</td>
<td></td>
<td>17,520</td>
</tr>
</tbody>
</table>

Note: Indirect expenses of Rs. 1,275 have been apportioned to processes X, Y, and Z in the ratio of 1200: 3000: 900 i.e., 4: 10: 3 respectively.

### 7.3.4 Accounting Adjustments in Process Costing

In process costing, the following four types of adjustments need to be made in accounts.

- Process losses - normal and abnormal
- Valuation of work in progress - equivalent production
- Joint products and by-products
- Inter-process profits

### 7.5 Process Losses and Wastages

In industries which employ process testing, a certain amount of loss occurs at various stages of production. Such a loss may arise due to chemical reaction, evaporation, inefficiency, etc. It is, therefore, necessary to keep accurate records of both input and output. Where loss occurs at a late stage in manufacture, it is apparent that financial loss is greater. This is because more and more costs are incurred in processes as products move towards completion stage. Process losses may by classified into normal and abnormal losses.

**Normal process loss**

The amount of loss which cannot be avoided because of the nature of material or process is normal process loss. Such a loss is quite expected under normal conditions. It is caused by factors like chemical change, evaporation, withdrawals for tests or sampling, unavoidable spoiled quantities, etc.

**Abnormal process loss**

This type of loss consists of loss due to carelessness, machine break-down, accident, use of defective materials, etc. Thus, it arises due to abnormal factors and represents a loss which is over and above the normal loss. Accounting procedure for normal and abnormal loss differs.
Accounting treatment of normal loss

It is a fundamental costing principle that the cost of normal losses should be borne by the good production. Normal loss is generally determined as a percentage of input. Sometimes such a loss is due to loss of weight, say, due to evaporation or chemical action. Since such wastage is not physically present, obviously it cannot have any value. However, when normal loss is physically present in the form of scrap, it may have some value, i.e. it may be sold at some price. Whenever scrapped material has any value, it is credited to the Process Account.

Example 1:
The following information is given in respect of process A.
Material’s 1,000 kg. @Rs. 6 per kg.
Labour Rs. 5,000
Direct expenses Rs. 1,000
Indirect expenses allocated to Process A Rs. 1,000. Normal wastage 10% of input Prepare Process A Account when:
(a) Scrap value of normal loss is nil.
(b) Scrap arising out of normal has a sale value of Re. 1 per unit.

Solution:
When scrap value of normal loss is nil.

<table>
<thead>
<tr>
<th>Process A Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulars</td>
</tr>
<tr>
<td>To Material</td>
</tr>
<tr>
<td>To Labour</td>
</tr>
<tr>
<td>To Direct exp</td>
</tr>
<tr>
<td>To Indirect exp</td>
</tr>
<tr>
<td>By normal loss</td>
</tr>
<tr>
<td>By transfer to process B</td>
</tr>
</tbody>
</table>

Cost per unit = Rs. 13,000 + 900 units = Rs. 14.44

The normal loss is absorbed by good production and as a result the cost per unit of good production inflates. When there is no loss, the cost per unit produced is Rs. 13 (i.e. 13,000 + 1,000 units). But when there is a normal loss, the cost per unit is higher at Rs. 14.44

(b) When scrap of normal loss has a sale value of Re. 1 per unit.

<table>
<thead>
<tr>
<th>Process A Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulars</td>
</tr>
<tr>
<td>To Material</td>
</tr>
<tr>
<td>To Labour</td>
</tr>
<tr>
<td>To Direct exp</td>
</tr>
<tr>
<td>To Indirect exp</td>
</tr>
<tr>
<td>By normal loss</td>
</tr>
<tr>
<td>By transfer to process B</td>
</tr>
</tbody>
</table>

Cost per unit = Rs. 12,900 + 900 units = Rs. 14.33

Whenever any value is realised from the sale of normal wastage, it reduces the cost to that extent.

Accounting treatment of abnormal process loss

It has been stated earlier that abnormal loss is due to carelessness, accidents, machine break-down and other abnormal reasons. Unlike normal loss, abnormal loss is not absorbed by good-production; rather it is transferred to Costing Profit and Loss Account. This is because if the cost of abnormal loss were to fall upon the good production, the cost thereof will fluctuate and the information provided would be misleading. In order to overcome this and also to
disclose the cost of abnormal loss, the following procedure may be adopted:
• Allow for normal loss in the manner described earlier.
• After considering normal loss, find out the cost per following formula:

\[
\text{Cost per unit} = \frac{\text{Total Cost of Normal Loss}}{\text{Units Introduced} - \text{Normal Loss Units}}
\]

• Multiply the cost per unit (calculated as above) by the number of units of abnormal loss. This gives the total value of abnormal loss.
• Credit the relevant process account with the quantity and value of abnormal loss.
• The balance figure in the process account is the cost of good units produced in the process. This can also be found by multiplying cost per unit with the number of good units produced.
• Open ‘abnormal loss account’ and debit it with the quantity and value of abnormal loss shown in the process account. Sale proceeds from abnormal loss are credited to abnormal loss account. Any balance left in this account is net loss and transferred to costing profit and loss account.

**Example 2:**
Fifty units are introduced into a process at a cost of rupee one each. The total additional expenditure incurred in the Process is Rs. 30. Of the units introduced, 10% are normally spoiled in the course of manufacture; these possess a scrap value of Re. 0.25 each. Owing to an accident, only 40 units are produced. You are required to prepare (i) Process Account, and (ii) Abnormal Loss Account.

**Solution:**

**Process Account**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Material</td>
<td>50</td>
<td>50.00</td>
<td>By normal loss @ Re. 0.25</td>
<td>5</td>
<td>1.25</td>
</tr>
<tr>
<td>To Expenses</td>
<td>50</td>
<td>30.00</td>
<td>By Abnormal loss</td>
<td>5</td>
<td>8.75*</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>80.00</td>
<td>By Transfer to next process (B/F)</td>
<td>40</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>80.00</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Cost of normal loss is calculated as follows:

\[
\text{Cost per unit} = \frac{\text{Total Cost of Normal Loss}}{\text{Units Introduced} - \text{Normal Loss Units}} = \frac{\text{Rs} 80.00 - 1.25}{45} = \frac{78.75}{45} = \text{Rs} 1.75
\]

Cost of Abnormal Loss = Abnormal Loss Units \times \text{Cost per unit} = 5 \times \text{Rs.} 1.75 = \text{Rs.} 8.75

**Abnormal loss account**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Process A/c</td>
<td>5</td>
<td>8.75</td>
<td>By sales @ Re 0.25 each By profit and loss a/c (balanced figure)</td>
<td>5</td>
<td>1.25</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>8.75</td>
<td></td>
<td>5</td>
<td>7.50</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>8.75</td>
<td></td>
<td>5</td>
<td>8.75</td>
</tr>
</tbody>
</table>

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Abnormal gain or effectiveness
The normal process loss represents the loss that would be expected under normal conditions. It is an estimated figure. The actual loss may be greater or less than the normal loss. If the actual loss is greater than normal loss, it is known as abnormal loss. But if actual loss is less than normal loss, a gain is obtained which is termed as abnormal gain or effectiveness. The value of abnormal gain is calculated in a manner similar to abnormal loss. It is shown on the debit side of the Process Account and credit side of the Abnormal Gain Account. Like abnormal loss, it is ultimately transferred to Costing Profit and Loss Account. This is illustrated below:

Example
Using the figures of illustration of the above example except that actual output is 47 units, show how the process account will be prepared. Also prepare Abnormal Gain Account. Solution When normal output is 45 units and actual output is 47 units, there is an abnormal gain of 2 units. This is shown in the following account.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Material</td>
<td>50</td>
<td>50</td>
<td>By normal loss</td>
<td>5</td>
<td>1.25</td>
</tr>
<tr>
<td>To Expenses</td>
<td>30</td>
<td>3.50</td>
<td>By transfer to next</td>
<td>47</td>
<td>82.25</td>
</tr>
<tr>
<td>To Abnormal gain</td>
<td>2</td>
<td>3.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>83.50</td>
<td></td>
<td>52</td>
<td>83.50</td>
</tr>
</tbody>
</table>

The value of abnormal gain is calculated as follows:

\[
\frac{Rs \ 80 - Rs \ 125}{50 - 5 \text{ Units}} \times 2 \text{ Units} = Rs \ 3.50
\]

It should be noted that the method of valuation of abnormal gain is the same as that of abnormal loss.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
<th>Particulars</th>
<th>Units</th>
<th>Rs</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Normal loss A/c (Shortfall in the state of normal loss) To Profit &amp; Loss A/c (B.F)</td>
<td>2</td>
<td>0.50</td>
<td>By process A/c</td>
<td>2</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.00</td>
<td></td>
<td></td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3.50</td>
<td></td>
<td>2</td>
<td>3.50</td>
</tr>
</tbody>
</table>

7.6 Work in Progress (Equivalent Production)
Process costing mainly deals with continuous type of production. At the end of the accounting period, there may be some work-in-progress, i.e. semi-finished goods may be in the pipeline. The valuation of such work-in-progress is done in terms of equivalent or effective production.

7.6.1 Equivalent Production
Equivalent production represents the production of a process in terms of completed units. Work-in progress at the end of an accounting period is converted into equivalent completed units. This is done by the following formula:

\[
\text{Equivalent units} = \text{No. of units of work in progress} \times \text{Degree of completion in } \% \times \text{Percentage completion of process}
\]

For example, if there are 50 units in work-in-progress and these are estimated to be 50% complete, then their equivalent production is 50 units x 50% = 25 units.
In each process, an estimate is made of the degree of completion of work-in-progress in terms of percentage. Such an estimate, must be accurate because any error in such estimation will lead to erroneous valuation of work-in-progress stock which enters into final accounts.

**Evaluation of equivalent production**

After work-in-progress taken to evaluate it has been converted into equivalent completed units, the following steps are:

- Find out the total cost (net) for each element of cost i.e. Material, labour and overhead. Scrap value of normal loss is deducted from the material cost.
- Ascertain the cost per unit of equivalent production separately for each element of cost. This is done by dividing the total cost of each element by the respective number of equivalent units.
- At this rate of cost per unit, ascertain the value of finished production and work-in-progress.

For the purpose of computation of equivalent production and its evaluation; the following three statements are generally prepared.

- Statement of equivalent production
- Statement of cost (per unit)
- Statement of evaluation

These three statements may also be combined in one comprehensive statement called “Statement of Production, Cost and Evaluation.” For clear understanding, illustrations on equivalent production are classified into the following two categories:

- When there is no opening stock, i.e., when there is only closing stock of work-in-progress. In such a situation there may or may not be process losses.
- When there is opening as well as closing stock-Here also there may or may not be process losses.

**When there is no opening work-in-progress and no process loss**

In such a case, valuation of work-in-progress in terms of equivalent production is comparatively simple.

**When there is no opening work-in-progress but there are process losses**

As discussed earlier, losses are inherent in process operations. Normal and abnormal process losses are treated differently in the calculation of equivalent production.

**Normal loss**

Equivalent units of normal loss are taken as nil. In other words, normal loss is not added in the equivalent production. However, realisable value of normal scrap is deducted from the cost of material so as to calculate the net material cost. This net material cost becomes the basis of calculating the material cost per unit in the statement of cost.

**Abnormal loss**

This is treated as if this were good production lost. Abnormal loss, thus, is added to equivalent production with due consideration to its degree of completion. Unless the degree of completion is specified, it may be assumed that abnormal loss units are 100% complete in respect of all elements of cost.

**Abnormal gain**

Units of abnormal gain are represented by good finished production. It is therefore, always taken as 100% complete in respect of all elements of cost i.e. material, labour and overhead. Abnormal gain is deducted to obtain equivalent production.

**When there is opening as well as closing stock of work in progress**

In such cases there are two methods of calculating equivalent production:

- FIFO Method
- Average Cost Method
FIFO method (First in First out method)
This method is based on the assumption that work-in-progress moves on a first in first out basis. This means that unfinished work on the opening stock is completed first, before work on any new units is taken up. Thus no units from opening work-in-progress will be left incomplete and none of these find a place in the closing work-in-progress. In other words, closing stock will be from out of the materials introduced during the current period and will be valued at the current cost. The costs incurred during the current period will be distributed over opening stock of work-in-progress (for its completion), units introduced and completed during the period and closing stock of work-in-progress. This is done by dividing the costs incurred by the relevant equivalent production so as to arrive at the per unit cost of equivalent production. FIFO method gives satisfactory results when prices of materials, rates of wages and overheads are relatively stable.

Computation of equivalent production under FIFO method
The following steps are taken in the computation of equivalent production:

- State the opening stock of work-in-progress in equivalent completed units. This is done by applying the percentage of work needed to complete the unfinished work of the previous period. For example, if there are 200 units of opening work-in-progress which are 70% complete, then the equivalent units of this will be 200 x 30% (work required to complete the incomplete portion) = 60 units.
- Ascertain the number of units introduced into the process and deduct the number of units of closing work-in-progress. This gives the number of units started and completed during the period. Add these units to the opening stock of work-in-progress calculated above.
- Add to the above the equivalent completed unit of closing work-in-progress. This can be determined by applying the percentage of work done on the finished units at the end of the period.

Average cost method
In this method, the cost of opening work-in-progress is not kept separate but is averaged with the additional costs incurred during the period. This method thus combines the cost of opening work-in-progress and new units introduced. Information relating to degree of completion of opening WIP is not required.

In order to find out the cost per unit of equivalent production, the cost of each element (material, labour and overheads) applicable to the opening work-in-progress is added to the cost incurred in the current period for that element. A single cumulative total and unit cost is obtained. Units completed and transferred as well as closing work-in-progress will be valued at this average unit cost.

FIFO Method verses Average Method
Both FIFO and average methods have certain advantages of their own and it cannot be said that one method is either simpler or more accurate than the other. The main difference between these two methods is regarding the treatment of opening stock-in-progress.

In FIFO method, opening stock of work-in-progress is kept as a separate figure. Costs incurred to complete the opening work-in-progress are added to the opening work-ill-progress cost and the sum of these two costs is the total cost of completed units of opening work-in-progress at which it is transferred to the next process. The units which are introduced in the process and finished during the same period have their own cost per unit which may be different from the completed cost per unit of opening work-in-progress.

In average cost method, on the other hand, the cost of opening work-in-progress is added to material, labour and overhead costs incurred during the period. The cost per unit is computed by dividing the total of these costs by equivalent units.

7.7 Joint products and By-products
In many industries, two or more products are unavoidably produced from the same process and same raw materials. These products are produced in natural proportions which cannot be changed at the will of the management. For example, in an oil refinery, when crude oil is processed, many products are simultaneously produced from the same raw material. Examples of these products are petrol, kerosene, diesel, grease, etc. Such products are known as joint products or by-products.
7.7.1 Joint products
The term joint products are used for two or more products of almost equal value which are simultaneously produced from the same manufacturing process and the same raw material. Joint products thus represent two or more products separated in the course of processing, each product being in such proportion and of such a nattier that no single one of them can be regarded as the main product.

7.7.1.1 Characteristics of Joint Products
Characteristics of joint products are:

- Joint products are produced from the same raw material in natural proportions.
- They are produced simultaneously by a common process.
- They are comparatively of almost equal value.
- They may require further processing after their point of separation.

A classic example of joint products as given above is found in oil refining where items like petrol, diesel, naphtha, kerosene etc. are produced from the crude oil. Other examples are in flour mill where joint products are white flour, brown flour, and animal feeding stuff; in meat canning where joint products are hides, canned meat, fertilizers, etc. The term joint product is also used to describe various qualities of the same product, as for example, many grades of coal which may be produced in coal mining.

7.7.1.2 Joint Costs and Subsequent Costs
Joint (or common) costs are those costs which are incurred before that stage in manufacture at which the products get separated.

Subsequent (or attributable) costs, separation or split-off point. The distinction between joint costs and subsequent costs is important because when accounting for products. The joint costs are the main problem. This is because joint costs cannot be traced to individual products and the cost accountant is faced with the problem of apportioning the joint costs incurred to various joint products produced.

Subsequent costs, on the other hand, pose no accounting problem because such costs relate to individual products. These are, therefore, charged to the appropriate product and not regarded as Joint. It should be noted and remembered that selling and distribution costs are virtually always subsequent costs.

7.7.1.3 Accounting for Joint Products
Accounting for joint products means the apportionment of joint cost to each of the joint product. Such apportionment serves the following objectives:

- To determine the cost per unit of products.
- To help in inventory valuation.
- To determine the profit or loss on each line of product.
- To determine the price of each product.

7.7.1.4 Methods of Apportionment of Joint Cost
There are various methods of appointment of joint cost which are as follows:

- Sales Value Method
- Reverse cost Method
- Physical Units Method
- Average Unit Cost Method
- Survey Method
Sales Value Method
Under this method, joint costs are apportioned to various joint products on the basis of sales value of each such product. The sale value method has the following variants:

On the basis of unit prices
In this method, the selling prices per unit of various joint products are taken as the basis for apportionment of joint costs. In other words, joint cost is apportioned to various joint products in the ratio of selling prices of individual joint products without any regard to the quantities. It is thus suitable when the number of units of production of all the products is equal.

On the basis of sales value
In this method, the apportionment is done on the basis of weighted sales value i.e. number of units produced and sold x selling, price per unit. This method thus gives due consideration to the quantities of various joint products produced. The difference between the method based on unit selling prices discussed earlier and this method is that while the former gives no consideration to the quantities of joint products produced, the latter gives due importance to the quantities. This method will give satisfactory results even when numbers of units of different joint products are widely different.

Reverse Cost Method
In this method, the joint cost is apportioned on the basis of net value of each product. The net value is calculated by deducting the following from the sales value:

- Estimated profit margin
- Selling and distribution costs
- After split off processing costs

The net values of individual products so obtained are taken as the basis for apportioning joint costs. This is known as reverse cost method because net values are calculated by working backward from sales values. This method is particularly used when products are not sold at their stage at split off point but require further processing.

Physical Units Method
Under this method, the joint cost is apportioned on the basis of relative weight, volume or quantity, etc. of each product obtained at the point where the split off occurs. For the method to be suitable, the unit of measurement should be applicable for all products. E.g. usually gases, liquids and solids cannot be taken together. However, where joint products cannot be measured by the same measurement unit, the joint products must be converted to a denominator common to all the units produced. For instance in the manufacture of coke, products such as coke, coal tar, benzol, sulphate of ammonia, gas, etc., are measured in different units. The yield of these recovered units is measured on the basis of quantity of product extracted per tone of coal.

Average Unit Cost Method
In this method, the joint cost is apportioned by using the average unit cost which is obtained by dividing the total joint cost by the total number of units produced of all the products. The average cost per unit of each product is the same.

Survey Method
This method apportions the joint cost to various products on the basis of the results of a surveyor technical evaluation. In this survey, various factors like volume, selling price, marketing process etc. are studied and points or weights are assigned to each product. Costs are apportioned on the basis of such weights or points.

7.7.2 By-Products
By-products are products of relatively small value which are incidentally and unavoidably produced in the course of manufacturing the main product. For example, in sugar mills, the main product is sugar. But bagasse and molasses of comparatively smaller value are incidentally produced and thus are by-products. Other examples of by-products are oil cake produced in the extraction of edible oil, cotton seed produced in cotton textile industry, etc. These by-
products are unavoidably produced and are of secondary value. The sales value of these by-products is much less as compared to the main product. For example sales value of by-products bagasse and molasses is much less than that of the main product sugar.

By-products may be:
- those sold in their original form without further processing
- those which require further processing in order to be saleable

7.7.2.1 Distinction between Joint Products and By-products

There are no hard and fast rules to distinguish between joint products and by-products. A product may be treated as a joint product in one business and the same product may be treated as a by-product in another business. However, the following factors should be considered to determine if a product is a joint product or a by-product.
- Relative sales value: If the sales values of all the products are more or less equal, they are treated as joint products. If, however, there are wide differences in the relative sales values of products, the product with the greater sales value is treated as the main product and the products of lower value are treated as by-products.
- Objective of manufacture: If the objective of manufacturing is product A, then unwanted products B and C be treated as by-products.
- Policy of management: The management may decide to treat a particular product as the main product and the other products as by-products. Alternatively, it may choose to treat all products as joint products.

By-products, scrap and waste: By-products should not be confused with waste or scrap. Waste is used to describe a material which has no value or even negative value, if it has to be disposed of at some cost. Examples of waste are gases, smoke and other unsalable residues from the manufacturing process. Scrap is also different from by-products in the sense that it is the leftover part of the raw materials whereas by-products are different from the material which went into the production process. Small pieces of wood left in furniture manufacture or metal sheet pieces left in utensil manufacture are examples of scrap, whereas minor chemicals having some value, emerging from a chemical process are classified as by-product. Sale value of scrap is relatively less than that of by-products. However accounting treatment for scrap and by-products is quite similar.

7.7.2.2 Accounting for By-products

Various methods of accounting for by-products are as follows:

Where by-products are of small total value
In such a case it is not considered practicable to apportion any part of the joint cost to by-products. The net income realised by the sale of by-products may be treated, in anyone of the following two ways:
- It may be treated as ‘miscellaneous income’ and credited to costing profit and loss account.
- It may be credited to the process account in which the by-product has arisen.

In determining the net income from by-products, the following should be deducted from the sales value of by-products: (i) any selling and distribution expenses incurred in the sale of by-products and; (ii) any costs incurred in further processing of by-products to make them saleable.

Where by-products are of considerable total value
Where by-products are of considerable sales value. It is proper to apportion a part of the joint cost to by-products. Such apportioned cost of by-products is debited to by-product account and credited to the main product account or the relevant process account. Any cost incurred in further processing of the by-product is debited to by-product account. The by-product account is credited with its sales value and any profit/loss arising out of this account is transferred to costing Profit and Loss Account. The apportionment of joint cost to by-products can be done by any of the four methods discussed earlier in costing of joint products.

These methods are:
- Sales Value Method
- Physical Units Method
Average Cost Method

Points Value Or Survey Method

Where by-products require further processing
In such situations, the share of by-product in joint cost at the split-off point may be arrived at by subtracting the profit and the further processing cost from the realisable value of the products i.e., by using Reverse Cost Method. In case the cost of the by-products at the split off point is small or negligible, it may be treated as per the method discussed above. On the contrary, if it is of considerable amount, it is treated as per method apportioned to by-products discussed above, i.e. joint cost is apportioned to by-products.

7.8 Internal Process Profits (Inter-process Profit)
In some businesses, it is a practice to charge the output of each process to the next process not at cost but at a price showing profit to the transferor process. The transfer price may be the current market price or cost plus a fixed percentage. Thus each process is charged with its input at current price and no process obtains the benefits of saving or has to bear the losses caused by the efficiency or inefficiency of the earlier processes. In brief, the objects of such internal process profit are:

- To show whether the cost in each process competes with the market prices.
- To make each process stand on its own efficiency and economy.

To assist in making decisions such as to buy a partly processed material rather than to process work internally or to sell a partly processed product or to process it further.

Internal process profits have the disadvantage of complicating the costing records. The complications brought into the accounts arise from the fact that inter-process profit so introduced remains included in the price of process stocks, finished stocks and work-in-progress. For balance sheet purposes such stocks have to be reduced to actual cost because a firm cannot make profits by trading with itself.
Summary

- The term ‘methods’ and ‘systems’ are used synonymously to indicate an integrated set of procedures based on a complex concept of ideas, principles and concepts.
- Different methods of costing for different industries depend upon the production activities and the nature of business.
- Job costing (or job order costing) is a method of cost ascertainment used in job order industries.
- Direct expenses which can be identified with specific jobs are directly charged to completion of jobs. When jobs are completed, the cost is transferred to cost of sales account.
- Indirect materials, indirect wages and indirect expenses which cannot be identified with specific jobs are apportioned to cost centers.
- Absorption of overhead by the jobs passing through the cost centers is based upon percentage of direct wages or direct material cost, direct labour hours or machine hours, etc.
- A product may be treated as a joint product in one business and the same product may be treated as a by-product in another business.
- Production of job costing is of non-standard items with specifications and instructions from the customers.
- In Batch Costing, a lot of similar units which comprise the batch may be used as a cost unit for ascertainment of cost.
- Joint products thus represent two or more products separated in the course of processing, each product being in such proportion and of such a nature that no single one of them can be regarded as the main product.
- Both FIFO and average methods have certain advantages of their own and it cannot be said that one method is either simpler or more accurate than the other.

References

- Arora, M.N., Cost and Management Accounting: Theory, Problems and Solutions, Global Media.

Recommended Reading

Self Assessment

1. _______ the joint cost is apportioned on the basis of net value of each product.
   a. Reverse cost method
   b. Survey method
   c. New cost method
   d. Job cost method

2. _______ costing is a method of cost ascertainment used in job order industries.
   a. Process
   b. Job
   c. Survey
   d. Material

3. _______ costing, a lot of similar units which comprise the batch may be used as a cost unit for ascertainment of cost.
   a. Batch
   b. Process
   c. Job
   d. Material

4. _______ method apportions the joint cost to various products on the basis of the results of a survey or technical evaluation.
   a. Reverse cost method
   b. Job cost method
   c. New cost method
   d. Survey method

5. _______ poses no accounting problem because such costs relate to individual products.
   a. Joint cost
   b. Subsequent cost
   c. Reverse cost
   d. Production cost

6. Production of _______ costing is of non-standard items with specifications and instructions from the customers.
   a. survey
   b. production
   c. material
   d. job

7. Which of the following statement is true?
   a. Joint cost poses no accounting problem because such costs relate to individual products.
   b. A product cannot be treated as a joint product in one business and the same product may be treated as a by-product in another business.
   c. Job costing (or job order costing) is a method of cost ascertainment used in job order industries.
   d. Different methods of costing for different industries never depend upon the production activities and the nature of business.
8. Which of the following statement is false?
   a. Internal process profits have the disadvantage of complicating the costing records.
   b. Scrap is also different from by-products in the sense that it is the leftover part of the raw materials whereas by-products are different from the material which went into the production process.
   c. The sales value of these by-products is much less as compared to the main product. For example sales value of by-products bagasse and molasses is much less than that of the main product sugar.
   d. A product cannot be treated as a joint product in one business and the same product may be treated as a by-product in another business.

9. ___________ method, opening stock of work-in-progress is kept as a separate figure.
   a. FIFO
   b. Average
   c. Survey
   d. Production

10. ___________ for joint products means the apportionment of joint cost to each of the joint product.
    a. Survey
    b. Production
    c. Accounting
    d. Management
Chapter VIII
Financial Statement Analysis

Aim
The aim of this chapter is to:

• introduce financial statement

• explicate the meaning of financial statements

• explain limitations of financial statements

Objectives
The objectives of this chapter are to:

• explain the nature of financial statement

• elucidate equations for preparing common size income statements

• define profit and loss account

Learning outcome
At the end of this chapter, you will be able to:

• identify principal tools of analysis

• understand procedure of preparing common size income statement

• recognise the effect of accounting concepts and conventions
8.1 Meaning of Financial Statements

The term financial statements refer to two basic statements which an accountant prepares at the end of an accounting period for a business enterprise. These are:

- Balance Sheet (or Statement of Financial Position) which reflects the assets, liabilities and capital as on a certain date, and
- Profit and Loss Account (or Income Statement) which shows the results of operations i.e. profit or loss during a certain period.
- Other Statements - Apart from the Balance Sheet and Profit and Loss Account, the following financial statements are also prepared.
  - Profit and Loss Appropriation Account - This shows how profit of a business is utilised for declaring dividends, transfer to general reserve or other reserves etc.
  - Funds Flow Statement - This shows increase or decrease in working capital during the accounting period.
  - Cash Flow Statement: This shows changes in cash position between the beginning and end of the account period.

All these statements taken together are called package.

8.2 Nature of Financial Statements

The financial statements provide a summary of the accounts of business enterprises. According to The American Institute of Accountants, financial statements “reflect a combination recorded/acts, accounting conventions and personal judgments and the judgments and conventions applied affect them materially”. Thus the data exhibited in financial statements are the results of the combined effect of:

- recorded facts
- accounting conventions, and
- personal judgments used in the application of accounting conventions

8.2.1 Recorded Facts

The financial statements show the factual data drawn from the financial accounts. For example, items like cash in hand and at bank, cost of fixed assets, salaries paid etc. are the facts recorded in the books.

8.2.2 Accounting Conventions

Financial statements are affected to a large extent by the various accounting concepts and conventions. For example, because of going concern concept, fixed assets are recorded at cost and not at their market value. Similarly, due to the convention of conservatism, the stock-in-trade is valued at cost or market price whichever less is.

8.2.3 Personal Judgments

Although an accountant is guided by accounting concepts and conventions in preparing the financial statements, he has to exercise personal judgement in many cases which affect the financial statements. For example, an accountant has to decide whether to use straight line method or written down value method for depreciation of fixed assets. Similarly, an accountant has to make a judgement whether to provide 2% or 5% as provision for bad and doubtful debts. The financial statement data is the result of the combined effect of the above three factors.

8.3 Meaning of Financial Statement Analysis

Analysis of financial statements means an attempt to determine the significance and meaning of the data presented in financial statements. Such an analysis makes use of various analytical tools and techniques to data of financial statements so as to derive from them certain relationships that are significant and useful for decision making. In the words of John N. Myers, “Financial statement analysis is largely a study of the relationships among the various financial factors in a business as disclosed by a single set of statements and a study of the trends of these factors as shown in a series of statements.”
Thus, financial statement analysis converts the mass of data into useful information which is always in scarce supply. It pinpoints the strengths and weaknesses of a business undertaking by use of various techniques such as ratio analysis, comparative statements, etc. Such analysed information is used by management, bankers, creditors, investors and others to form judgement about the operating performance and financial position of the business. Thus financial statement analysis helps in evaluating a business performance according to some specific objectives.

8.4 Parties Interested in Financial Statement Analysis

Information contained in financial statements is useful to different categories of users of financial data. These are managers, shareholders, creditors, Government, auditors and other interested groups. Uses off financial data for each of these are briefly described below:

- **Management**: Management of a company is interested in its financial condition, profitability and progress. It uses a number of methods, tools and techniques available to it to analyse the financial data. Such analysis is used by the management to exercise control over the business and to make decision to run it more efficiently.

- **Shareholders**: Shareholders are the suppliers of basic capital to run the business. Such capital is exposed to all the risks of ownership. Shareholders are interested in the profitability, dividends declared and market value of their holdings. The current earnings of the company determine both dividends and market value of the shares. In other words, shareholders mainly analyse the profitability and long term solvency of the company.

- **Creditors**: Creditors include short-term creditors like bankers, trade creditors and also long term credit grantors like debenture-holders and financial institutions etc. All creditors are mainly interested in the short term and long-term solvency of the company. They are also interested in the profitability because profit is viewed as the primary source for payment of interest on loans and debentures.

- **Purchaser of Business**: Any person interested in the purchase of a going concern analyses the financial statements to determine its real value. It makes an assessment of the financial and operating strengths and weaknesses of the business.

- **Government**: Financial statements are used by various government departments like Income Tax, Sales Tax, Excise Duty, etc., to determine the tax liability of the company. On the basis of such financial statements of companies in different industries, the Government determines tax policy, import-export policy, industry policy, etc.

- **Other Interested Groups**: Financial statement analysis also serves the needs of many other user groups. For example, workers’ trade unions analyse the financial statements to prepare ground for collective bargaining, to claim bonus etc.

Lawyers also use financial statement analysis in furtherance of their investigative and legal work. Researchers also get useful data from the analysis of financial statement to make comparative study of profitability of many companies.

8.5 Significance and Purposes of Financial Statement Analysis

Financial statement analysis performs the essential function of converting mass data into useful information. Such analysed financial information serves many and varied purposes as described below:

- **Judging Profitability**: Profitability is a measure of the efficiency and success of a business enterprise. A company which earns profits at a higher rate is definitely considered a good company by the potential investors. The potential investors analyse the financial statements to judge the profitability and earning capacity of a company so as to decide whether to invest in a company or not.

- **Judging Liquidity**: Liquidity of a business refers to its ability to pay off its short-term liabilities when these become due. Short-term creditors like trade creditors and bankers make an assessment of liquidity before granting credit to the company.

- **Judging Solvency**: Solvency refers to the ability of a company to meet its long-term debts. Long-term creditors like debenture-holders and financial institutions judge the solvency of a company before any lending decisions. They analyse company’s profitability over a number of years and its ability to generate sufficient cash to be able to repay their claims.
Judging the Efficiency of Management: Performance and efficiency of management of a company can be easily judged by analysing its financial statements. Profitability of a company is not the only measure of company’s managerial efficiency. There are a number of other ways to judge the operational efficiency of management. Financial analysis tells whether the resources of the business are being used in the most effective and efficient way.

Inter-firm Comparison: A comparative study of financial and operating efficiency of different firms is possible only after proper analysis of their financial statements. For this purpose it is also necessary that the financial statements are kept on a uniform basis so that financial data of various firms are comparable.

Forecasting and Budgeting: Financial analysis is the starting point for making plans by forecasting and preparing budgets. Analysis of the financial statements of the past years helps a great deal in forecasting for the future.

8.6 Limitations of Financial Statements
It is a general impression that financial statements are precise, exact and final. But sometimes these statements conceal some very important information. As such they suffer from certain limitations. These are discussed below:

Effect of accounting concepts and conventions: Various concepts and conventions of accounting affect the values of assets and liabilities as shown in the Balance Sheet. Similarly profit or loss disclosed by Profit and Loss Account is also affected by these concepts and conventions. For example, on account of the going concern concept and also the convention of conservatism, the balance sheet does not show current economic values of various assets and liabilities.

Effect of personal judgments: The financial statements are influenced, to a certain extent, by the personal judgments of the accountant. For example, the amount of provision for bad and doubtful debts depends entirely on the judgement and past experience of the accountant. Similarly, an accountant has also to make a judgement about the method and rate of depreciation for fixed assets. There are numerous instances when an accountant has to exercise his personal judgement in which there is an element of Subjectivity. The quality of the financial statements thus depends upon the competence and integrity of those who are responsible for preparing these statements.

Recording only monetary transactions: Financial statements record only those transactions and events which can be expressed in terms of money. But there are many factors which are qualitative in nature and cannot be expressed in monetary terms. These non-monetary factors do not find any place in the financial statements. For example, efficiency and loyalty of workers, personal reputation and integrity of the managing director of the company, advertisement policy of the company etc. are not capable of being expressed in money terms and thus find no place in financial statement ever though they materially affect the profitability of a business.

Historical in nature: Financial statements disclose data which is basically historical in nature i.e., it tells what has happened in the past. These statements do not give future projections.

Ignores human resources: No business can prosper without an efficient work force. But financial statements do not include human resources which is a very important asset for a business.

Ignores social costs: Apart from earning a fair return on investments, a business has certain social responsibilities. Financial statements do not make any attempt to show the social cost of its activities. Examples of social cost of a manufacturing company are air pollution, water pollution, occupational diseases, work injuries, etc.

8.7 Principal Tools of Analysis
In the analysis of financial statements, the analyst has available a number of tools from which he has to choose best suited to his specific purpose. The following are the principal tools of analysis of financial statements:

- Comparative Financial Statements
- Common-size Financial Statements
- Ratio Analysis
- Funds Flow Statement
- Cash Flow Statement
8.8 Comparative Financial Statements

Comparison of financial statements is one of the very important tools of analysis of financial statements. It has been seen that Balance Sheet and Profit and Loss Account are the two most important financial statements. Information contained in these financial statements for a particular year is extremely important and useful. However, such information becomes still more useful if it is compared with the data shown in the financial statements of the previous few years. Such comparison of financial statements is accomplished by setting up Balance Sheet and Profit and Loss Account of two years side by side and studying the changes that have occurred in the individual figures therein from year to year and over the years. Thus comparison of financial statements means financial statements of a company for any year are compared with financial statements of that company for earlier years.

8.9 Comparative Balance Sheet

A comparative balance sheet has two columns for the data of the original balance sheets. A third column is prepared to show the increases and decreases in rupees in various assets and liabilities. A fourth column is generally added to show percentages of increases and decreases. Thus, there are generally total four columns in a comparative balance sheet.

Example 1

From the following information prepare a Comparative Balance Sheet.

<table>
<thead>
<tr>
<th>Items</th>
<th>31st December 2002</th>
<th>Increase or Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002 Rs.</td>
<td>2003 Rs.</td>
</tr>
<tr>
<td>Equity Share Capital</td>
<td>4,00,000</td>
<td>6,00,000</td>
</tr>
<tr>
<td>Debentures</td>
<td>2,00,000</td>
<td>3,25,000</td>
</tr>
<tr>
<td>Sundry Creditors</td>
<td>2,55,000</td>
<td>1,17,000</td>
</tr>
<tr>
<td>Bank Overdraft</td>
<td>7,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Total Liabilities and Capital</td>
<td>8,62,000</td>
<td>10,52,000</td>
</tr>
<tr>
<td>Plant and Machinery</td>
<td>1,00,000</td>
<td>2,00,000</td>
</tr>
<tr>
<td>Land and Building</td>
<td>3,60,000</td>
<td>5,40,000</td>
</tr>
<tr>
<td>Investments</td>
<td>2,70,000</td>
<td>1,70,000</td>
</tr>
<tr>
<td>Sundry Debtors</td>
<td>1,00,000</td>
<td>88,000</td>
</tr>
<tr>
<td>Cash in hand</td>
<td>32,000</td>
<td>54,000</td>
</tr>
<tr>
<td>Total Assets</td>
<td>8,62,000</td>
<td>10,52,000</td>
</tr>
</tbody>
</table>

Solution:
8.10 Comparative Income Statement (or Profit and Loss Account)

An income statement shows the net profit or net loss resulting from the operation of a business for a definite period of time. A comparative income statement is prepared to show the net profit or loss for a number of years in comparative form. By comparing income statement for two or more years, it is possible to observe the progress of a business.

A comparative income statement contains the same columns as the comparative balance sheet and provides the same type of information. The first two columns are provided to show the balances of various accounts for two years for which comparison is to be made. Third column is provided to show the change i.e., increase or decrease in various items in absolute amounts in rupees, the fourth column shows the increase or decrease for each term in percentage.

Example 2
From the following information, prepare a comparative Income Statement.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31-3-2002</th>
<th>31-3-2003</th>
<th>Absolute Change</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>10,00,000</td>
<td>8,00,000</td>
<td>(-)2,00,000</td>
<td>(-)20.00</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>6,00,000</td>
<td>4,00,000</td>
<td>(-)2,00,000</td>
<td>(-)33.33</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>4,00,000</td>
<td>4,00,000</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Operating Expenses:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adm. Selling and Distribution Expenses</td>
<td>2,00,000</td>
<td>1,40,000</td>
<td>(-)60,000</td>
<td>(-)30.00</td>
</tr>
<tr>
<td>Net Operating Profit</td>
<td>2,40,000</td>
<td>2,60,000</td>
<td>20,000</td>
<td>50.00</td>
</tr>
<tr>
<td>Other Incomes</td>
<td>40,000</td>
<td>20,000</td>
<td>20,000</td>
<td>50.00</td>
</tr>
<tr>
<td>Net Profit before tax</td>
<td>2,40,000</td>
<td>2,80,000</td>
<td>40,000</td>
<td>16.67</td>
</tr>
<tr>
<td>Income Tax (50% of Net Profit)</td>
<td>1,20,000</td>
<td>15,40,000</td>
<td>20,000</td>
<td>16.67</td>
</tr>
<tr>
<td>Net Profit after Income tax</td>
<td>1,20,000</td>
<td>1,40,000</td>
<td>20,000</td>
<td>16.67</td>
</tr>
</tbody>
</table>

Solution:
Comparative Income Statement
For two years 2002 and 2003

8.11 Common Size Statements

Common size statement is a type of comparative financial statement in which each item of the financial statement is expressed as a percentage of the appropriate total. The appropriate total is taken as 100 per cent and each item is shown as a proportion of this 100 per cent. Such a statement is also known as 100 per cent Statement or 'Vertical analysis'. It should be noted that when a comparative statement is prepared for a number of years to show the trend, it is known as Horizontal analyses. A common size statement may be prepared for balance sheet as well as income statement.
Common Size Balance Sheet: In common size balance sheet, each item in the asset is shown as a percentage of total assets and each item in liability and capital is shown as a percentage of total liabilities and capital (which is the same as total assets). In other words, the total of the assets and also that of liabilities and capital is taken as 100 per cent and each item appearing on the assets side as well as liabilities side is shown as a proportion of the total of 100.

Example 3
Refer to example 1. A common size Balance Sheet is prepared as follows:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>31st December 2002</th>
<th>31st March 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs.</td>
<td>% of Total</td>
</tr>
<tr>
<td>Liabilities and Capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity Share Capital</td>
<td>4,00,000</td>
<td>46.60</td>
</tr>
<tr>
<td>Debentures</td>
<td>2,00,000</td>
<td>23.20</td>
</tr>
<tr>
<td>Sundry creditors</td>
<td>2,55,000</td>
<td>29.58</td>
</tr>
<tr>
<td>Bank Overdraft</td>
<td>7,00</td>
<td>0.82</td>
</tr>
<tr>
<td>Total Liabilities and Capital</td>
<td>8,62,000</td>
<td>100</td>
</tr>
<tr>
<td>Plant and Machinery</td>
<td>1,00,000</td>
<td>11.60</td>
</tr>
<tr>
<td>Land and Building</td>
<td>3,60,000</td>
<td>41.76</td>
</tr>
<tr>
<td>Investments</td>
<td>2,70,000</td>
<td>31.32</td>
</tr>
<tr>
<td>Sundry Debtors</td>
<td>1,00,000</td>
<td>11.60</td>
</tr>
<tr>
<td>Cash in hand</td>
<td>32,000</td>
<td>3.72</td>
</tr>
<tr>
<td>Total Assets</td>
<td>8,62,000</td>
<td>100</td>
</tr>
</tbody>
</table>

8.11.1 Procedure of Preparing Common Size Balance Sheet
Assume total of the balance sheet as 100 per cent. Then express each item in the balance sheet as a percentage of totals of 100. For instance, in the above example, equity capital on 31st March 2002 is Rs. 4,00,000. Total of the balance sheet on this date is Rs. 8,62,000. We can now calculate percentage of equity capital in the total of 100 per cent as follows:

Equity Capital Debentures = \( \frac{4,00,000}{8,62,000} \) x 100 = 46.40%

Similarly calculation of other items in the balance sheet is made. For example,

Debentures = \( \frac{2,00,000}{8,62,000} \) x 100 = 23.20%

Plant and Machinery = \( \frac{1,00,000}{8,62,000} \) x 100 = 11.60%

As on 31st March 2003, each item is calculated as a percentage of Rs. 10,52,000. For example,

Equity Capital = \( \frac{10,52,000}{10,52,000} \) x 100 = 57.03%

Plant and Machinery = \( \frac{10,52,000}{10,52,000} \) x 100 = 19.01%

Land and Building = \( \frac{5,40,000}{10,52,000} \) x 100 = 51.33%

In this way each and every item is calculated.
8.11.2 Common Size Income Statement

This statement is similar to common size balance sheet. In the common income statement, total sales figure is taken as 100 per cent and each item is then calculated as a percentage of sales.

Example: 4

Use the date given in example 2 to prepare a Common Size Income Statement.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rs.</td>
<td>% of Sales</td>
</tr>
<tr>
<td>Sales</td>
<td>10,00,000</td>
<td>100.00</td>
</tr>
<tr>
<td>Less: Cost of Goods Sold</td>
<td>6,00,000</td>
<td>60.00</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>4,00,000</td>
<td>40.00</td>
</tr>
<tr>
<td>Less: Operating Expenses:</td>
<td>2,00,000</td>
<td>20.00</td>
</tr>
<tr>
<td>Net Operating Profit</td>
<td>2,00,000</td>
<td>20.00</td>
</tr>
<tr>
<td>Other Incomes</td>
<td>40,000</td>
<td>4.00</td>
</tr>
<tr>
<td>Net Profit before tax</td>
<td>2,40,000</td>
<td>24.00</td>
</tr>
<tr>
<td>Less: Income Tax (50% of Net Profit)</td>
<td>1,20,000</td>
<td>12.00</td>
</tr>
</tbody>
</table>

Net Profit after tax = 1,20,000 = 12.00% = 17.50%

8.11.3 Procedure of Preparing Common Size Income Statement

Total net sales figure is taken as 100% and then each item appearing in the income statement is taken as a percentage of sales. For example, in the above illustration, sales of Rs. 10,00,000 in the year 2002 are taken as 100 per cent. Then cost of sales is calculated as a percentage of sales as follows:

\[
\frac{\text{Cost of Goods Sold}}{\text{Sales}} \times 100 = \frac{6,00,000}{10,00,000} \times 100 = 60\%
\]

Similar calculation for other items is made as follows:

\[
\text{Gross Profit} = \frac{4,00,000}{10,00,000} \times 100 = 40\%
\]

\[
\text{Operating expenses} = \frac{2,00,000}{10,00,000} \times 100 = 20\%
\]

\[
\text{Net Operating Profit} = \frac{2,00,000}{10,00,000} \times 100 = 20\%
\]

\[
\text{Other Incomes} = \frac{40,000}{10,00,000} \times 100 = 4\%
\]

\[
\text{Net Profit before tax} = \frac{2,40,000}{10,00,000} \times 100 = 24\%
\]

\[
\text{Income tax} = \frac{1,20,000}{10,00,000} \times 100 = 12\%
\]

Calculations for the year 2003 are done similarly.
Summary

- The term financial statements refer to two basic statements which an accountant prepares at the end of an accounting period for a business enterprise.
- The financial statements provide a summary of the accounts of business enterprises.
- According to The American Institute of Accountants, financial statements “reflect a combination recorded/acts, accounting conventions and personal judgments and the judgments and conventions applied affect them materially”.
- The financial statements show the factual data drawn from the financial accounts.
- Financial statements are affected to a large extent by the various accounting concepts and conventions.
- Although an accountant is guided by accounting concepts and conventions in preparing the financial statements, he has to exercise personal judgement in many cases which affect the financial statements.
- Analysis of financial statements means an attempt to determine the significance and meaning of the data presented in financial statements.
- Financial statement analysis is largely a study of the relationships among the various financial factors in a business as disclosed by a single set of statements and a study of the trends of these factors as shown in a series of statements.
- Financial statement analysis helps in evaluating a business performance according to some specific objectives.
- Management of a company is interested in its financial condition, profitability and progress.
- Financial statements are used by various government departments like Income Tax, Sales Tax, Excise Duty, etc., to determine the tax liability of the company.
- Financial statement analysis performs the essential function of converting mass data into useful information.
- Analysis of the financial statements of the past years helps a great deal in forecasting for the future.
- Financial statements record only those transactions and events which can be expressed in terms of money.
- Comparison of financial statements is one of the very important tools of analysis of financial statements.
- In common size balance sheet, each item of asset is shown as a percentage of total assets and each item of liability and capital is shown as a percentage of total liabilities and capital (which is the same as total assets).
- Common size statement is a type of comparative financial statement in which each item of the financial statement is expressed as a percentage of the appropriate total.
- A comparative income statement is prepared to show the net profit or loss for a number of years in comparative form.

References

Recommended Reading

Self Assessment

1. Match the followings

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Balance Sheet</td>
<td>A. Shows how profit of a business is utilised for declaring dividends</td>
<td></td>
</tr>
<tr>
<td>2. Profit and Loss Account</td>
<td>B. Reflects the assets, liabilities and capital as on a certain date</td>
<td></td>
</tr>
<tr>
<td>3. Profit and Loss Appropriation Account</td>
<td>C. Shows the results of operations</td>
<td></td>
</tr>
<tr>
<td>4. Cash Flow Statement</td>
<td>D. Shows changes in cash position between the beginning and end of the accounting period</td>
<td></td>
</tr>
</tbody>
</table>

a. 1-A, 2-D, 3-B, 4-C
b. 1-C, 2-B, 3-D, 4-A
c. 1-B, 2-C, 3-A, 4-D
d. 1-D, 2-A, 3-C, 4-B

2. Which statement shows increase or decrease in working capital during the accounting period?
   a. Cash Flow Statement
   b. Funds Flow Statement
   c. Income Statement
   d. Statement of Financial Position

3. Match the following

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Financial statements</td>
<td>B. Financial condition, profitability and progress</td>
<td></td>
</tr>
<tr>
<td>3. Management</td>
<td>C. Ability of a company to meet its long-term debts</td>
<td></td>
</tr>
<tr>
<td>4. Judging Solvency</td>
<td>D. Bankers, trade creditors, debenture-holders</td>
<td></td>
</tr>
</tbody>
</table>

a. 1-D, 2-A, 3-B, 4-C
b. 1-C, 2-B, 3-D, 4-A
c. 1-A, 2-D, 3-C, 4-B
d. 1-B, 2-C, 3-A, 4-D

4. __________ are the suppliers of basic capital to run the business.
   a. Analysers
   b. Creditors
   c. Managers
   d. Shareholders

5. __________ is a measure of the efficiency and success of a business enterprise.
   a. Liquidity
   b. Profitability
   c. Solvency
   d. Budgeting

6. Identify Liquidity
   a. Liquidity is a measure of the efficiency and success of a business enterprise.
   b. Liquidity refers to the ability of a company to meet its long-term debts.
   c. Liquidity of a business refers to its ability to pay off its short-term liabilities when these become due.
   d. Liquidity tells whether the resources of the business are being used in the most effective and efficient way.
7. Financial analysis is the starting point for making plans by forecasting and preparing ____________.
   a. budgets
   b. balance sheets
   c. resources
   d. claims

8. Which of the following statements is false?
   a. There is no way to judge the operational efficiency of management.
   b. Long-term creditors like debenture-holders and financial institutions judge the solvency of a company before any lending decisions.
   c. Analysis of the financial statements of the past years helps a great deal in forecasting for the future.
   d. Short-term creditors like trade creditors and bankers make an assessment of liquidity before granting credit to the company.

9. In ____________, each item of asset is shown as a percentage of total assets and each item of liability and capital is shown as a percentage of total liabilities and capital.
   a. common size statement
   b. common size balance sheet
   c. comparative financial statement
   d. comparative balance sheet

10. Which of the following is not the principal tool of analysis of financial statements?
    a. Common-size Financial Statements
    b. Ratio Analysis
    c. Funds Flow Statement
    d. Forecasting and Budgeting
Case Study I

Business Management Case Study: How Cisco IT reduced Telecom Costs through Centralized Invoice Tracking?

Background
More than a decade after the company was founded; the management team at Cisco Systems realised that more than US$200 million per year was being paid out to a broad range of telephony and data service providers, and that these costs were essentially unmanaged. Each business group received its own invoices, which were paid without any approval process or corporate-wide policies in place. “Most companies today set up a telecom infrastructure, and then walk away from the ongoing management of it,” explains Mark Edmondson, manager of IT services expenses for Cisco. “But telecom is a dynamic part of any company. When our company’s growth translated into an extremely large operating cost for telecom, management started asking for ways to track and control these telephony and data expenses. It became clear that we needed to adopt a strategic approach for the analysis and management of telecom costs so that we could make informed decisions about future operations.”

Challenge
In 1997, the Cisco finance team created the Telecom Cost Management (TCM) program to effectively manage the company’s exponentially increasing telephony and data service costs. Cisco IT Project Manager Pam Lisotta became the first TCM employee and was tasked with centralising all U.S. invoices. Lisotta recalls the situation she faced: “Managers would come to me about their department costs - they were being charged back for pagers and phones but had no idea how the money was being spent. They wanted to know the costs being invoiced by each vendor, the cost of each service from those vendors, and how much each of their employees was spending. They also wanted to know how to negotiate better contracts with the vendors, and other ways to drive down costs. We set out to get answers to all of these questions.”

Finding answers began with gathering data. Vendors were directed to send all invoices directly to Lisotta. Initially, an Excel spreadsheet sufficed for managing all the invoices. Lisotta confirmed charges, ensured that services were still needed, and cancelled unnecessary services for vacant buildings and other warranted situations. Once the invoices were centralised, a senior financial analyst was hired to look at the data. The analyst examined the telecom costs collectively and developed metrics to track where money was being spent, where costs were increasing, and at what rates; evaluate overall telecom spending trends; and identify problems. Together, Lisotta and the analyst generated reports summarising costs by service, and created tools to track and analyze variances. All of this work was done manually.

This initial phase of the TCM program - one person processing all invoices, and one analyst summarising the invoices and extracting insights - changed the overall company view of these operating costs. Telephony was no longer viewed as a fixed expense, but as an operational variable that could be managed strategically to contribute to the company’s future success. The program ran in this manner for approximately five years. All invoices, once processed and analyzed, were then approved and sent to accounts payable for payment. But several factors made it apparent that a new solution for telecom billing was essential for continued success:

- The company growth taxed the current process, and an automated solution was necessary for both processing and analyzing telecom invoices.
- As the numbers of employees increased, so did the number of services being purchased by company employees. Employees were using company-paid cell phones, pagers, and calling cards without oversight, and Internet access costs for telecommuters were increasing. The TCM group was processing invoices for the expanding service offerings from this ever-increasing collection of vendors.
- Differences in vendor business practices added layers of complexity to the billing management task. Vendor accounting and invoicing processes, service product structures and bundles, accrual practices, and many other variables were taxing the manual tracking and analysis processes.
- Internal IT databases and tools had been developed over recent years, but were not being employed to streamline
telecom billing. The databases provided consolidated information about employees and reporting structures. The tools, built as Web applications, automated employee requests for services, provisioning of services, and the management of in-place services and related inventories of telecom equipment. These Cisco IT-developed tools worked within the enterprise management (EMAN) framework, a workflow solution built for the Cisco global network. EMAN tracked and logged the status of every asset, assigned asset identifiers, and provided a foundation for routing requests to vendors, tracking requests from user initiation through to service deployment, and resolving problems arising at any point in the process.

- Taking into account these conditions, the TCM group set out to implement an automated telecom billing solution. They faced several challenges during this process:
  - Global diversity of practices - Data collection in the United States was relatively straightforward, but telecom billing practices varied greatly in other countries. Different countries used different ledgers, and an international solution also required an in-depth understanding of global currencies. The TCM group initially designed the solution for the U.S., with plans to roll it out globally as soon as possible.
  - Data inconsistencies - Dozens of different accounts payable teams meant resolving differences in payment timing, accrual practices, spending categories, and other parameters.
  - Vendor technology variances - Supported media, Web access, electronic data entry capabilities, and other characteristics varied widely, with some vendors still completely reliant on paper invoicing.
  - Data complexity - Some invoices contained charges for multiple services, such as vendors that billed local calls, long-distance calls, calling cards, and ISDN lines on the same invoice.
  - Attitude adjustments - Education was required to overcome the perception that telecom costs are simply “a fixed cost of doing business” and to provide users with the information they needed to make wise decisions about resource usage. For example, many users routinely used their cell phones even when in an office where lower-cost landlines were available.

Solution

The new telecom billing solution takes advantage of a centralised provisioning database previously set up as part of a vendor services solution (see the Cisco IT case study “Vendor Management” at [www.cisco.com/web/about/ciscoitatwork/business_of_it/vendor_management.html](http://www.cisco.com/web/about/ciscoitatwork/business_of_it/vendor_management.html)). All employees, when they join Cisco, are entered into the database with details regarding the telecom assets for which they are approved. As equipment and services are provisioned to that employee, the database is updated to track status and inventory. For telecom billing, the database also includes information regarding the accounts to be billed, the managers that approve the related invoices, and the receivers of the reports generated regarding the service.

An important change for the new telecom billing solution was the introduction of an outsourced vendor. The invoices are now processed and entered by the vendor, freeing the internal team from the data entry tasks. While a vendor performs this initial step, the information is immediately returned to the Cisco IT team where the bulk of the invoice billing solution is carried out on the Cisco network. The invoice workflow is automatically linked to the Cisco Enterprise Management (EMAN) system, which has been enhanced to complement reconciliation methods for identifying asset-billing discrepancies. Web-based applications analyze the invoices and reconcile them against EMAN’s inventory database. With the reconciliation function in place, vendors are quickly notified of billing errors including overcharges, deviations from contract terms, and charges for previously cancelled services. Vendor management teams are armed with accurate, up-to-date data when they regularly meet with vendors to review services and contracts.

Another new Web-based tool - the Services Expense Reporting Tool (SERT) - generates reports about telecom costs and makes that information available to the global Cisco community. Individual usage reports are sent to users and their managers, and monthly billing summaries are available to various management teams. The tool has allowed managers and corporate executives at Cisco to gain in-depth understanding about telecom spending and the impact of new services on operating costs. By utilising an internal solution for expense reporting, they retain the ability to get real-time access to expense information in a variety of formats. Reports can be modified to suit operational needs without waiting for a vendor to respond. Security is also more effectively managed and maintained with the internal reporting function.
The new SERT reports have had an impact on both users and management at Cisco. Users now receive detailed expense reports, which are also sent to their managers. Creative communications from the IT team have increased awareness of telecom expenditures and have resulted in dramatic decreases in spending. Initially, a “Top Talker” report was sent out each month, with the names of the Cisco employees within each manager’s department with the highest phone charges. E-mail reminders were sent out to the top 20 spenders for each service, with copies sent to the employee’s manager and the group’s controller. The report and e-mails raised awareness of phone costs, and the links between telephone usage and corporate expenses, within the U.S. offices.

Results

Industry watchers report that approximately 7 to 12 percent of billed telephony services are in error. The TCM program has achieved cost savings in line with these industry estimates, and will exceed them as the program continues to evolve and grow to include international Cisco operations.

In its first years with manually managing the invoices and initial spending reports, dramatic cost savings resulted from the identification of billing errors and changes to spending habits within the Cisco user base. The automated telecom billing solution is now well established in the U.S. and continues to trim telecom costs from quarter to quarter. Since its inception, the TCM program has delivered an overall 15 percent reduction in networking, telephony, and PC vendor services spending. Several years ago, these services accounted for more than US$300 million in operating costs, and therefore the 15 percent reduction translates into millions of dollars of trimmed expenses. This savings can be considered even more dramatic when considering the technology and business changes that have taken place over the same time period:

Headcount has increased. Major technology innovations have been introduced, including numerous improvements to the network infrastructure, the introduction of IP telephony, and the migration to a companywide mobile desktop platform. The numbers of service providers has increased significantly, with many more services now offered to Cisco employees. For example, when choosing a network access solution, an employee has almost twice as many options available today compared to early days of the TCM program.

In its first year, the automated EMAN-based invoicing solution yielded savings of 5 percent annually, or more than US$10 million. Edmondson says, “We are continuing to enhance our tools, and expect to easily increase our savings another 2 to 7 percent per year. Part of this increase in savings will come from the continued drop in service prices, and part will come from our extension of the program to our global operations. Other increases will come from new tools. Eventually, we want to entirely automate the handling of all invoices and allow our internal personnel to focus exclusively on analysis and the identification of strategic cost-management opportunities. In the short term, there are hundreds of small Telco shops and providers. Many still invoice on paper, so the data entry and data processing tasks remain more labor-intensive. As we work with these providers to encourage automation on their side, future savings will be realised. With the larger vendors, we already get all of the invoice information electronically, feeding it directly into our system.”

The Cisco culture has traditionally given a lot of freedom to every employee,” says Edmondson. “In the case of controlling telecom costs, this freedom led to some unwise usage patterns. If we had put the telecom billing solution in place from the beginning, even before the costs warranted strict controls, we could have avoided the need to adjust user attitudes and habits. Relearning can be a painful process for a group of assertive, creative individuals!”


Questions

1. Why and when Telecom Cost Management program was created?

Answer:

In 1997, the Cisco finance team created the Telecom Cost Management (TCM) program to effectively manage the company’s exponentially increasing telephony and data service costs.
2. Describe the work of enterprise management?
   
   **Answer:**
   
   EMAN tracked and logged the status of every asset, assigned asset identifiers, and provided a foundation for routing requests to vendors, tracking requests from user initiation through to service deployment, and resolving problems arising at any point in the process.

3. What was the important change for the new telecom billing solution?
   
   **Answer:**
   
   An important change for the new telecom billing solution was the introduction of an outsourced vendor. The invoices are now processed and entered by the vendor, freeing the internal team from the data entry tasks. While a vendor performs this initial step, the information is immediately returned to the Cisco IT team where the bulk of the invoice billing solution is carried out on the Cisco network.
Case Study II

Client case study: Fleet risk and cost management

Introduction
This case study describes how we work with an organisation on an ongoing basis to identify, risk access and manage their risk and cost exposures within their fleet, logistics and supply-chain operations. The client first asked us to undertake a complete organisational business risk review and make recommendations for improvements in control. This lead to an ongoing project to create and implement a business focused health & safety management system, which included some elements related to their fleet operation. However, that did not resolve all the client’s risk and cost exposure, so we were then asked to undertake a comprehensive review of their fleet and related operations, and used our Fleet Risk Profiler management system to support the risk profiling, risk assessment and action plan processes.

Organisational Profile
The company is privately owned and has three main ‘divisions’ covering large household items, retail builders’ merchants and high end showrooms. The wholesale business covers the whole of England & Wales from a main depot in the South and a feeder depot in the North. The other two divisions operate from five combined locations in the South.

Management challenges
The client was faced with the following issues to resolve:
- Risk of losing licence to operate commercial vehicles
- Lack of ‘fleet management’ competency
- Inefficient vehicle allocation / routing
- Poor control of drivers, especially agency drivers
- High vehicle accident damage costs
- Increasing failed and delayed deliveries

Project Process
Our consultants worked with company management, employees and external service providers, and supported by our Fleet Risk Profiler management system:
- Interviewed key people
- Reviewed policies, procedures and record systems
- Identified the operational risk profile of the fleet and related operations using 16 factors
- Risk assessed strategic, management and operational processes using 8 risk areas and over 250 risk elements

Main findings and conclusions
Their fleet and related operations comprise approximately 45 heavy goods vehicles; 65 vans and 50 cars. The heavy goods vehicles are used for the heavy-side business, large deliveries between depots, high volume contract customers and wide area deliveries – some with sleeper cabs. The vans are used to deliver product throughout England & Wales and for local deliveries. The cars are provided to Directors, managers and sales representatives, with a small ‘grey-fleet’ for those who have chosen to opt-out of the company scheme. Servicing was carried out by an external small provider and vehicle procurement was managed by the Operations Director, who had some experience in this field, but could not spend the time required to manage all fleet risk management activities consistently.

- Fleet operations were fragmented and local management practices were based on the knowledge & experience of the ‘transport manager’ at each location. There was no consistent approach and no management standards for guidance.
- High probability of losing license to operate commercial vehicles due to poor control/records and therefore increased potential for regulatory infringements
• The level of accidents and load damage costs was high, but the records system did not capture all direct, let alone the in-direct costs of all ‘incidents’
• The allocation of vehicles was inefficient, both in terms of low load efficiency and the allocation of vehicles based on load types/sizes/journey profile etc.
• Inefficient vehicle routing, poor loading efficiency and increasing per item delivery costs

**Action Planning & Main Actions**
We then used the data from the interviews and the analysis provided by the Fleet Risk Profiler system to create a prioritized risk and cost reduction plan, which agreed the following actions:

• Outsource fleet operational management, which although initially increased ‘management costs’, it did in total over time provide the following benefits:
  • Enabled the client to receive consistent and competent fleet management & operational advice.
  • Generated savings in transport/vehicle costs.
  • Reduced employee turnover through better training and management of drivers.
  • Reduced dependency on agency drivers and appointed new agency, with a service level agreement.
  • Reduced accidents and vehicle damage/repair costs.
  • Reduced load damage costs and improved customer service
• Introduce greater control of vehicle movements through the introduction of a linked route planning and telemetry system, as the existing levels of controls did not allow operational management to manage their risks/costs and improve vehicle utilisation.
• Appoint an external vehicle supply company to implement an appropriate and consistent vehicle specification and purchasing arrangement to reduce costs and improve the utilisation of vehicles.
• Appoint a larger company to undertake consistent and compliant vehicle checking, servicing and repairs to improve the service level and response times, enable more accurate budgeting of costs and establish a legally compliant vehicle records system.

**Results**
Initially the management fee for the external fleet operational company increased the overall costs of the client’s fleet and related operations. However, within 24 months risks and costs were being brought under control and had reduced the overall costs to the original level, without the ‘management fee’. Ongoing improvements in risk and cost management are still being made and costs are expected to reduce to below the original level within 3 years. A further review about outsourcing is underway.


**Questions**
1. What was the organisation profile?
2. What are the various project challenges?
3. What are the various management challenges?
Case Study III

Cost Accounting

ABC Pvt. Ltd, a new comer in small manufacturing firm of formals and casuals wears. Product range includes, shirts and T- Shirts (Full & Half sleeves), trousers and jeans, cargos, etc. As it is a newly introduced firm, the burden is on the Finance Manager of deciding the Accounting method for maintaining books of Account in a factory.

By considering all the factors determining cost, such as cost structure, condition of market, type of consumer, area of distribution, capacity of supply, product’s demand & supply, etc. Manager has to decided to follow the Cost Accounting for maintaining factory A/c or Manufacturing A/c. Cost Accounting does not includes physical stock-taking, but it includes detailed & relevant cost figure of closing stock, raw material, work-in-progress and finished goods. This helped the manager to find out most suitable and accurate cost per unit. These also helped him to avoid – material wastages, use of obsolete machinery, poor planning, etc.

They took control over material, labour and overhead expenses, and started discussing day-to-day operations of business, so they can take remedial actions. Moreover, introduction of a cost reduction programme combined with operational research and value analysis leads to improvement in economic as well as financial condition of the firm.


Questions
1. How cost Accounting helps the firm in determining the Selling Price?
2. According to you, by adopting Cost Accounting method, Can a firm prepare a Financial Statement?
3. From the case, what are the benefits/ Advantages enjoyed by a firm, by adopting Cost Accounting?)
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Recommended Reading

Self Assessment Answers

Chapter I
1. a
2. b
3. a
4. c
5. b
6. d
7. c
8. d
9. a
10. a

Chapter II
1. c
2. a
3. b
4. d
5. a
6. d
7. a
8. d
9. a
10. b

Chapter III
1. a
2. c
3. a
4. b
5. b
6. a
7. d
8. b
9. a
10. a

Chapter IV
1. a
2. c
3. a
4. b
5. b
6. c
7. a
8. c
9. a
10. a
Chapter V
1. a
2. c
3. b
4. d
5. d
6. a
7. b
8. c
9. a
10. d

Chapter VI
1. b
2. a
3. c
4. d
5. a
6. b
7. d
8. c
9. d
10. a

Chapter VIII
1. c
2. b
3. a
4. d
5. b
6. c
7. a
8. a
9. b
10. d