

## accounting

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### Managerial accounting

Although published financial statements are the most widely visible products of business accounting systems and the ones with which the public is most concerned, they are only the tip of the iceberg. Most accounting data and most accounting reports are generated solely or mainly for the company's managers. Reports to management may be either summaries of past events, forecasts of the future, or a combination of the two. Preparation of these data and reports is the focus of managerial accounting, which consists mainly of four broad functions: (1) budgetary planning, (2) cost finding, (3) cost and profit analysis, and (4) performance reporting.

#### Budgetary planning

The first major component of internal accounting systems for management's use is the company's system for establishing budgetary plans and setting performance standards. The setting of performance standards requires also a system for measuring actual results and reporting differences between actual performance and the plans (see below Performance reporting).



Figure 1: Budget planning and performance reporting.

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The simplified diagram in Figure 1 illustrates the interrelationships between these elements. The planning process leads to the establishment of explicit plans, which then are translated into action. The results of these actions are compared with the plans and reported in comparative form. Management can then respond to substantial deviations from plan, either by taking corrective action or, if outside conditions differ from those predicted or assumed in the plans, by preparing revised plans.

Although plans can be either broad, strategic outlines of the company's future or schedules of the inputs and outputs associated with specific independent programs, most business plans are periodic plans—that is, they refer to company operations for a specified period of time. These periodic plans are summarized in a series of projected financial statements, or budgets.

The two principal budget statements are the profit plan and the cash forecast. The profit plan is an estimated income statement for the budget period. It summarizes the planned level of selling effort, shown as selling expense, and the results of that effort, shown as

sales revenue and the accompanying cost of goods sold. Separate profit plans are ordinarily prepared for each major segment of the company's operations.



Figure 2: Relationship of company profit plan to responsibility

structure.

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The details underlying the profit plan are contained in departmental sales and cost budgets, each part identified with the executive or group responsible for carrying out that part. Figure 2 shows the essence of this relationship: the company's profit plan is really the integrated product of the plans of its two major product divisions. The arrows connecting the two divisional plans represent the coordinative communications that tie them together on matters of mutual concern.

The exhibit also goes one level farther down, showing that division B's profit plan is really a coordinated synthesis of the plans of the division's marketing department and manufacturing department. Arrows again emphasize the necessary coordination between the two. Each of these departmental plans, in turn, is a summary of the plans of the major offices, plants, or other units within the division. A complete representation of the company's profit plan would require an extension of the diagram through several layers to encompass every single responsibility centre in the entire company.

Many companies also prepare alternative budgets for operating volumes other than the volume anticipated for the period. A set of such alternative budgets is known as the flexible budget. The practice of flexible budgeting has been adopted widely by factory management to facilitate evaluation of cost performance at different volume levels and has also been extended to other elements of the profit plan.

The second major component of the annual budgetary plan, the cash forecast or cash budget, summarizes the anticipated effects on cash of all the company's activities. It lists the anticipated cash payments, cash receipts, and amount of cash on hand, month by month throughout the year. In most companies, responsibility for cash management rests mainly in the head office rather than at the divisional level. For this reason, divisional cash forecasts tend to be less important than divisional profit plans.

Company-wide cash forecasts, on the other hand, are just as important as company profit plans. Preliminary cash forecasts are used in deciding how much money will be made available for the payment of dividends, for the purchase or construction of buildings and equipment, and for other programs that do not pay for themselves immediately. The amount of short-term borrowing or

short-term investment of temporarily idle funds is then generally geared to the requirements summarized in the final, adjusted forecast.

Other elements of the budgetary plan, in addition to the profit plan and the cash forecast, include capital expenditure budgets, personnel budgets, production budgets, and budgeted balance sheets. They all serve the same purpose: to help management decide upon a course of action and to serve as a point of reference against which to measure subsequent performance.

Planning is a management responsibility, not an accounting function. To plan is to decide, and only the manager has the authority to choose the direction the company is to take. Accounting personnel are nevertheless deeply involved in the planning process. First, they administer the budgetary planning system, establishing deadlines for the completion of each part of the process and seeing that these deadlines are met. Second, they analyze data and help management at various levels compare the estimated effects of different courses of action. Third, they are responsible for collating the tentative plans and proposals coming from the individual departments and divisions and then reviewing them for consistency and feasibility and sometimes for desirability as well. Finally, they must assemble the final plans management has chosen and see that these plans are understood by the operating executives.

#### **Cost finding**

A major factor in business planning is the cost of producing the company's products. Cost finding is the process by which the company obtains estimates of the costs of producing a product, providing a service, performing a function, or operating a department. Some of these estimates are historical—how much did it cost?—while others are predictive—what will it cost?

The basic principle in cost finding is that the cost assigned to any object—an activity or a product—should represent the amount of cost that object causes. The most fully developed methods of cost finding are used to estimate the costs that have been incurred in a factory to manufacture specific products. The simplest of these methods is known as process costing. In this method, the accountant first accumulates the costs of each separate production operation or process for a specified period of time. The total of these costs is then restated as an average by dividing it by the total output of the process during the same period.

Process costing can be used whenever the output of individual processes is reasonably uniform or homogeneous, as in cement manufacturing, flour milling, and other relatively continuous

production processes.

A second method, job order costing, is used when individual production centres or departments work on a variety of products rather than just one during a typical time period. Two categories of factory cost are recognized under this method: prime costs and factory overhead costs. Prime costs are those that can be traced directly to a specific batch, or job lot, of products. These are the direct labour and direct materials costs of production. Overhead costs, on the other hand, are those that can be traced only to departmental operations or to the factory as a whole and not to individual job orders. The salary of a departmental supervisor is an example of an overhead cost.

Direct materials and direct labour costs are recorded directly on the job order cost sheets, one for each job. Although not traceable to individual jobs, overhead costs are generally assigned to them by means of overhead rates—*i.e.*, the ratio of total overhead cost to total production volume for a given time period. A separate overhead rate is usually calculated for each production department, and, if the operations of a department are varied, it is often subdivided into a set of more homogeneous cost centres, each with its own overhead rate. Separate overhead rates are sometimes used even for individual processing machines within a department if the machines differ widely in such factors as power consumption, maintenance cost, and depreciation.

Because output within a cost centre is not homogeneous, production volume must be measured by something other than the number of units of product, such as the number of machine hours or direct labour hours. Once the overhead rate has been determined, a provision for overhead cost can be entered on each job order cost sheet on the basis of the number of direct labour hours or machine hours used on that job. For example, if the overhead rate is \$3 a machine hour and Job No. 7128 used 600 machine hours, then \$1,800 would be shown as the overhead cost of this job.

Many production costs are incurred in departments that don't actually produce goods or provide salable services. Instead, they provide services or support to the departments that do produce products. Examples include maintenance departments, quality control departments, and internal power plants. Estimates of these costs are included in the estimated overhead costs of the production departments by a process known as allocation—that is, estimated service department costs are allocated among the production departments in proportion to the amount of service or support each receives. The departmental overhead rates then include provisions for these allocated costs.

A third method of cost finding, activity-based costing, is based on the fact that many costs are driven by factors other than product volume. The first task is to identify the activities that drive costs. The next step is to estimate the costs that are driven by each activity and state them as averages per unit of activity. Management can use these averages to guide its efforts to reduce costs. In addition, if management wants an estimate of the cost of a specific product, the accountant can estimate how many of the activity units are associated with that product and multiply those numbers by the average costs per activity unit.

For example, suppose that costs driven by the number of machine hours average \$12 per machine hour, costs driven by the number of production batches average \$100 a batch, and the costs of keeping a product in the line average \$100 a year for each kind of material or component part used. Keeping in the line a product that is assembled from six component parts thus incurs costs of  $6 \times \$100 = \$600$  a year, irrespective of volume and even if the product is not made at all during the period. If annual production amounts to 10,000 units, the unit cost of product maintenance is  $\$600/10,000 = \$.06$  a unit. If this product is manufactured in batches of 1,000 units, then batch-driven costs average  $\$100/1,000 = \$.10$  a unit. And, if a batch requires 15 machine hours, hour-driven costs average  $15 \times \$12/1,000 = \$.18$  a unit. At the 10,000-unit volume, then, the cost of this product is  $\$.06 + \$.10 + \$.18 = \$.34$  a unit plus the cost of materials.

Product cost finding under activity-based costing is almost always a process of estimating costs before production takes place. The method of process costing and job order costing can be used either in preparing estimates before the fact or in assigning costs to products as production proceeds. Even when job order costing is used to tally the costs actually incurred on individual jobs, the overhead rates are usually predetermined—that is, they represent the average planned overhead cost at some production volume. The main reason for this is that actual overhead cost averages depend on the total volume and efficiency of operations and not on any one job alone. The relevance of job order cost information will be impaired if these external fluctuations are allowed to change the amount of overhead cost assigned to a particular job.

Many systems go even farther than this. Estimates of the average costs of each type of material, each operation, and each product are prepared routinely and identified as standard costs. These are then readily available whenever estimates are needed and can also serve as an important element in the company's performance reporting system, as described below.

Similar methods of cost finding can be used to determine or estimate the cost of providing services rather than physical goods. Most advertising agencies and consulting firms, for example, maintain some form of job cost records, either as a basis for billing their clients or as a means of estimating the profitability of individual jobs or accounts.

The methods of cost finding described in the preceding paragraphs are known as full, or absorption, costing methods, in that the overhead rates are intended to include provisions for all manufacturing costs. Both process and job order costing methods can also be adapted to variable costing in which only variable manufacturing costs are included in product cost. Variable costs are those that will be greater in total in the upper portions of the company's normal range of volumes than in the lower portion. Total fixed costs, in contrast, are the same at all volume levels within the normal range.

Unit cost under variable costing represents the average variable cost of making the product. The main argument for the variable costing approach is that average variable cost is more relevant to short-horizon managerial decisions than average full cost. In deciding whether to manufacture goods in large lots, for example, management needs to estimate the cost of carrying larger amounts of finished goods in inventory. More variable costs will have to be incurred to build the inventory to a higher level; fixed manufacturing costs presumably will be unaffected.

Furthermore, when a management decision changes the company's fixed costs, the change is unlikely to be proportional to the change in volume; therefore, average fixed cost is seldom a valid basis for estimating the cost effects of such decisions. Variable costing eliminates the temptation to assume without question that average fixed cost can be used to estimate changes in total fixed cost. When variable costing is used, supplemental rates for fixed overhead production costs must be provided to measure the costs to be assigned to end-of-year inventories because generally accepted accounting principles in the United States and in most other countries require that inventories be measured at full product cost for external financial reporting.

#### **Cost and profit analysis**

Accountants share with many other people the task of analyzing cost and profit data in order to provide guidance in managerial decision making. Even if the analytical work is done largely by others, they have an interest in analytical methods because the systems they design must collect data in forms suitable for analysis.

Managerial decisions are based on comparisons of the estimated future results of the alternative courses of action that the decision maker is choosing among. Recorded historical accounting data, in contrast, reflect conditions and experience of the past. Furthermore, they are absolute, not comparative, in that they show the effects of one course of action but not whether these were better or worse than those that would have resulted from some other course.

For decision making, therefore, historical accounting data must be examined, modified, and placed on a comparative basis. Even estimated data, such as budgets and standard costs, must be examined to see whether the estimates are still valid and relevant to managerial comparisons. To a large extent, this job of review and restatement is an accounting responsibility. Accordingly, a major part of the accountant's preparation for the profession is devoted to the study of methods and principles of analysis for managerial decision making.

#### **Performance reporting**

Once the budgetary plan has been adopted, accounting's next task is to prepare information on the results of company activities and make it available to management. The manager's main interest in this information centres on three questions: Have his or her own actions had the results expected, and, if not, why not? How successful have subordinates been in managing the activities entrusted to them? What problems and opportunities seem to have arisen since the budgetary plan was prepared? For these purposes, the information must be comparative, relating actual results to the level of results that management regards as satisfactory. In each case, the standard for comparison is provided by the budgetary plan.



Much of this information is contained in periodic financial reports. At the top management and divisional levels, the most important of these is the comparative income statement, one of which is illustrated in Table 4. This shows the profit that was planned for this period, the actual results received for this period, and the differences, or variances, between the two. It also gives an explanation of some of the reasons for the difference between a planned and an actual income.

The report in this exhibit employs the widely used profit contribution format, in which divisional results reflect sales and expenses traceable to the individual divisions, with no deduction for head office expenses. Company net income is then obtained by deducting head office expenses as a lump sum from the total of the divisional profit contributions. A similar format can be used within the division, reporting the profit contribution of each of the

division's product lines, with divisional headquarters expenses deducted at the bottom.

By far the greatest number of reports, however, are cost or sales reports, mostly on a departmental basis. Departmental sales reports usually compare actual sales with the volumes planned for the period. Departmental cost performance reports, in contrast, typically compare actual costs incurred with standards or budgets that have been adjusted to correspond to the actual volume of work done during the period. This practice reflects a recognition that volume fluctuations generally originate outside the department and that the department head's responsibility is ordinarily limited to minimizing cost while meeting the delivery schedules imposed by higher management.

For example, a factory department's output consists entirely of a single product, with a standard materials cost of \$3 a unit and standard labour cost of \$16. Materials cost represents three pounds of raw materials at \$1 a pound; standard labour cost is two hours of labour at \$8 an hour. Overhead costs in the department are budgeted at \$10,000 a month plus \$2 a unit. Under normal conditions, volume is 7,000 units a month, but during October only 6,000 units were produced. The cost standards for the month would be as follows:

materials	6,000 units × 3 lb × \$1.00 per lb =	\$18,000
labour	6,000 units × 2 hr × \$8.00 per hr =	\$96,000
overhead	6,000 units × \$2.00 + \$10,000 =	\$22,000

The actual cost this month was \$17,850 for materials (17,000 pounds at \$1.05), \$101,250 for labour (12,500 hours at \$8.10 an hour), and \$23,000 for overhead. A summary report would show the following:

	actual	standard	variance
materials	\$17,850	\$18,000	\$150
labour	101,250	96,000	(5,250)
overhead	23,000	22,000	(1,000)
total	<u>\$142,100</u>	<u>\$136,000</u>	<u>\$(6,100)</u>

These variances may be analyzed even further in order to identify the underlying causes. The labour variance, for example, can be seen to be the result of both high wage rates (\$8.10 instead of \$8.00) and high labour usage (12,500 hours instead of 12,000). The factory accountant ordinarily would measure the effect of the rate change in the following way:

actual labour cost = 12,500 × \$8.10 =	\$101,250
(actual hours × actual wage rate)	
actual labour hours at standard	
wage rate = 12,500 × \$8.00 =	<u>100,000</u>
labour rate variance	<u>\$(1,250)</u>

The labour usage variance would then be obtained as follows:

actual labour hours × standard wage rate	
= 12,500 × \$8	\$100,000
standard labour cost (standard labour hours	
× standard wage rate) = 6,000 × 2 × \$8	<u>96,000</u>
labour usage variance	<u>\$(4,000)</u>

In most cases, the labour rate variance would not be reported to the department head, because it is not subject to his or her control.

Standard costing systems no longer have the central importance they commanded in many industries up to the 1970s. One reason is that significant changes in management technology have shifted the focus of cost control from the individual production department to larger, more interdependent groups. Just-in-time production systems require changes in factory layouts to reduce the time it takes to move work from one station to the next. They also reduce the number of partly processed units at each work station, thereby requiring greater station-to-station coordination.

At the same time, management's emphasis has shifted from cost control to cost reduction, quality enhancement, and closer coordination of production and customer deliveries. Most large manufacturing companies and many service companies have launched programs of total quality control and continuous improvement, and many have replaced standard costs with a more flexible approach using prior period results as current performance standards. Management is also likely to focus on the amount of system waste by identifying and minimizing activities that contribute nothing to the value that customers place on the product.

Reducing set-up time, inspection time, and time spent moving work from place to place while maintaining or improving quality are some of the results of these programs. Advances in computer-based models have enabled companies to tie production schedules more closely to customer delivery schedules while increasing the rate of plant utilization. Some of these changes actually increase variances from standard costs in some departments but are undertaken because they benefit the company as a whole.

The overall result is that control systems are likely to focus in the first instance on operational controls (real-time signals to operating

personnel that some immediate remedial action is required), with after-the-fact analysis of results focusing on aggregate comparisons with past performance and the planned results of current improvement programs.

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