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Management needs to close the budget loop by recognizing that planning and control are interdependent. Budgeting must serve both ends if it is to make a real contribution to the decision process.

ACCOUNTING FOR THE FUTURE

by Robert K. Jaedicke and Jay M. Smith, Jr.
Stanford University

THE use of budgets throughout modern-day business operations is probably as widespread an accounting practice as exists. Yet, it is not unusual to find at least two views of the budgetary process; that is, a distinction is made between a planning budget and a control budget.

Witness the phrase "budgetary control." In this context, control is thought of and, in our experience, is frequently carried out as a process of performance evaluation, or as a process of securing conformance to a plan (the budget). That is, the budget is established for the firm and is then broken down into department budgets; the budget becomes a goal against which to measure performance of individuals, and a good deal of the emphasis is put on meeting the budget, or perhaps beating the budget.

Another view of the budget focuses on planning. This is the whole field of "profit planning," where various alternatives open to the firm are evaluated in terms of their impact on future profits. The sum total of the alternatives which are selected forms the basis of the planning budget for the coming period.

When one observes the practice of budgeting as well as the budgeting literature, he is frequently left with the impression that these two uses of budgets are dissimilar and quite independent of one another. The purpose of this paper is to discuss the inter-relationships between planning and control with a view toward exploiting the full potential of the budgetary process.

The Decision Process. One of the objectives of accounting is to aid management in carrying out the decision process. In order to clarify the role of accounting in this process, it is helpful to characterize the process. One useful way to view decision making is as a process of reacting to changed conditions. If the economic conditions of the marketplace (for either products or factors of production) are constantly changing, the management is faced with the problem of making decisions which will give optimum profits in light of the changed conditions. The question is, how can the accountant provide data, tools, techniques, etc., which will help management make decisions in the changing environment? Certainly the budgetary process has much potential as a way of improving the decision process.

If conditions are changing, management must make operating adjustments. Price schedules may have to be revised, alternate raw materials may have to be used; at the extreme, perhaps a product line should be canceled or perhaps the firm should go out of business! The process of making new plans and revising old plans can be facilitated if the budgetary process is fully exploited. Accountants have long recognized the need for a plan against which to control operations. They now need to "close the budget

loop" and reveals that budgetary control is an important element in the planning process.

In order to fully utilize the power of budgeting, the firm must establish a system where the emphasis is on integrating control and planning. A framework for such a management control system is suggested in this article. There is also a discussion of the potential uses of computers as a way of analyzing and improving the information feedback part of the over-all system.

Management Control System

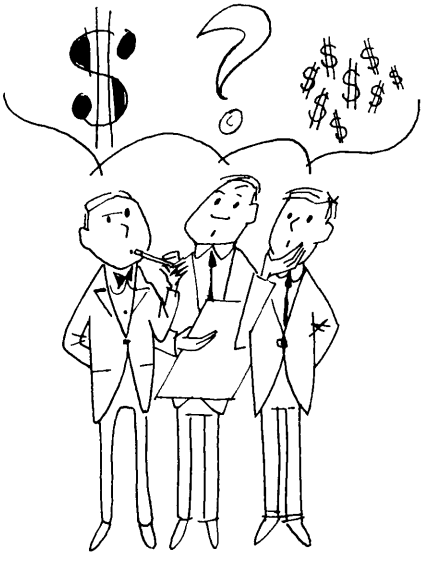
The use of the word "control" in the above title is intended to have a much broader connotation than that normally attributed to it. Performance evaluation and securing conformance to standards are certainly two phases of control included in the concept. In addition, however, control as it is used here includes planning and the revision of these plans as required by changed conditions. The revisions in the plan may be occasioned by a change in external environmental conditions, or by internal conditions which were found, through experience, to differ from those originally estimated. Thus, the traditional "planning" and "control" functions are included within the control system itself.

In the following discussion of the control process (as defined above), we will describe the phases that are typical of any effective management control system. The phases to be described are not necessarily mutually exclusive or collectively exhaustive. This discussion is offered in the spirit of providing a useful framework against which to evaluate and discuss the kinds of changes in the budgetary process which are necessary to make this process a complete and effective management control system.

1. The Plan. The first phase in the control system is to establish a plan (budget) for the unit of activity. The unit of activity is, of course, the control center. It may be a production process, a sales territory, a product line, a division, or the company as a whole.

In order to judge whether or not a plan is acceptable, the management must have settled on the objectives of the firm. If, for example, maximum long-run profit is the primary objective, then the desirability of the plan or the relative desirability of several plans can be judged in terms of their probable effect on the profits of the firm.

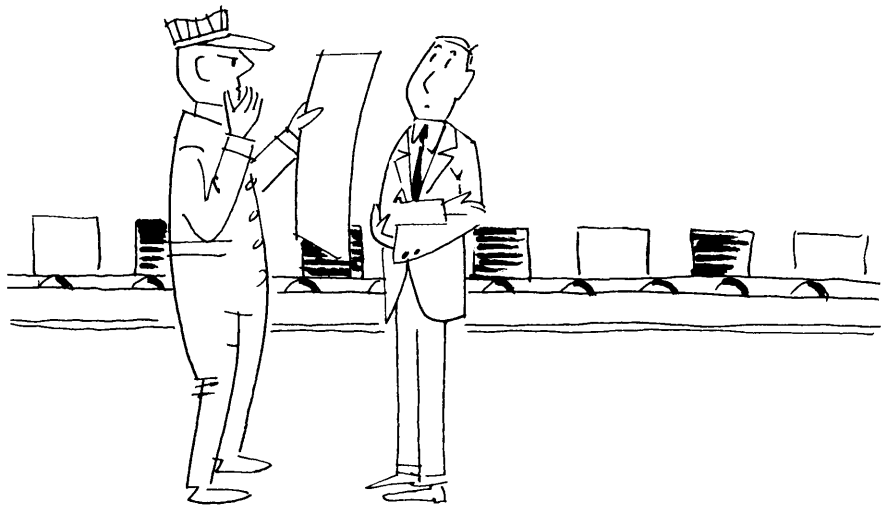
The manager faces two very important problems in this phase of the control process, either of which may result in the failure to actually maximize long-run profit. In the first place, it is usually difficult to determine if the "best" plan has been included in the set of plans under review. That is, there is always some risk that alternatives exist which have not been considered. This risk can be reduced only by more careful analysis of logical alternatives.



A second problem arises with respect to those plans which are under review. The presence of uncertainty and the possible lack of sufficient quantitative data may make it difficult to completely evaluate possible alternatives in terms of their impact on long-run profit of the firm. Hindsight may reveal that the wrong plan has been selected. Increased experience in budgeting and forecasting will tend to reduce the significance of both of these problems. Also, the possible use of the electronic computer to partially solve both of these problems will be discussed later in the article.

Once the firm's plan has been established, the budget or plan for each activity to be controlled will also have been selected. It is important in this phase of the control system that the units of activity be established in such a way that responsibility can be assigned to certain individuals within the organization for carrying out the activity in question. To elaborate somewhat, the activity may be a division within the organization, such as the Buick Division of General Motors. This is a fairly broad and complex unit of control, and there may be several subunits of control within this major unit. However, so far as the division is concerned, there will undoubtedly be a division manager who is responsible for all divisional operations. On the other hand, the unit of control may be a production department which is charged with the responsibility of producing some single subunit or component used in one of the many final products of the company. The responsibility of this department may simply be to produce a given number of components at a certain standard cost. The standard cost, in effect, forms a plan or budget. The main idea is that control is carried out through a process of assigning responsibility to individuals for certain parts of the company's operation.

Once the unit of activity has been selected, and once the plan has been made for each unit of activity, the plan can be thought of, in a broad sense, as an index. That is, with a plan there is an *index* of planned performance for the unit of activity for a coming operating period. The master plan for the firm then is translated into various planned indices for the various units of control that exist throughout the firm's organization. It should be emphasized here that the internal organization of the firm be-



The manufacturing foreman's performance should be measured by an index such as standard cost that includes only those factors he actually controls.

comes very important. Certainly it is a necessary, although not a sufficient, condition that the organization of the company must be a good one before control can be effective. The justification for this statement can easily be seen, since the assignment of responsibility is a very important ingredient in a successful control plan.

2. *Measurements of Actual Performance.* The second phase in the control system involves the measurement of the index of actual performance. The index used to measure the actual performance must, of course, be the same as the index used in the planning budget so that the two are comparable. As an illustration of this point, consider the direct costing controversy. It seems to us that the direct costing method and philosophy make more sense for profit planning and budgeting than does the absorption or full costing method. To the extent that breakeven analysis and cost-profit-volume analysis are used in the profit planning or budget planning phase, it is best to keep fixed cost as a period rather than a product cost. Even in the control phase of budgeting, it seems to us that the most useful set of variances on overhead, for example, are derived from use of the variable overhead rate only, rather than the full rate including a prorata share of fixed costs. If these observations are correct, then the budget can best be prepared by using direct costing. If the planned index is in direct cost terms, then the actual index must be in direct cost terms. To prepare interim statements on a full cost basis and compare the results against a direct cost budget would not give a very meaningful comparison.

At this point, it makes sense to consider some of the criteria that are appropriate in selecting the proper index, given the unit of activity. Consider, for example, the index that might be appropriate to judge the performance of a division manager as compared with the index that might be used to judge the performance of the department foreman. In the former case, the division manager probably has responsibility and authority for such factors as selling price, the number of units sold, the combination of products to be produced and sold, etc. In short, his responsibility and authority for various decisions are quite broad. He enjoys a great deal of autonomy, much more autonomy than is enjoyed by the manufacturing foreman. An appropriate index in such an instance might be the profit of the division related to the investment, or the return on investment. This is a fairly broad index because his profit responsibility involves not only the production of units at a minimum cost, but also the price at which the products are sold, the combination of products, etc.

Consider now the manufacturing foreman. Here is an instance where the amount of production may, in fact, be scheduled for the foreman by some supervisor higher up in the organization. It may be that the foreman is to conform to certain manufacturing quality standards, and the factors of production to be used in producing the unit may also be determined by the supervisor. Consequently, the sole responsibility of the foreman is to conserve on the utilization of the productive factors in producing the scheduled number of units at the specified manufacturing standards. In this case, a standard cost of production covering only those costs to be incurred by the foreman seems to be an appropriate index. This is a much narrower type of index than return on investment. This is as it

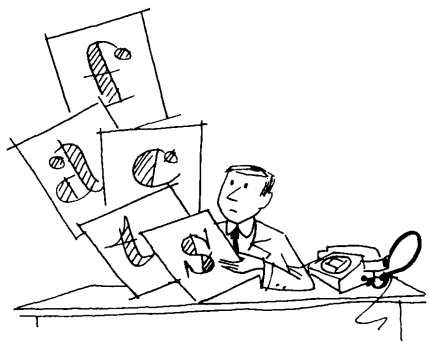
should be, since the decision-making responsibility and authority of the department foreman are not as broad as the division manager's.

These two illustrations point up one very important criterion for judging the appropriate index, given any unit of activity. This criterion is that the index ought to be broad enough to encompass as many of the operating (decision) variables as possible over which the decision maker or responsible person has authority and control; however, it should *not* be so broad as to include any operating factors over which the responsible person does not have control. In short, this means assign those costs to the individuals who have responsibility for incurring them. If this criterion is followed, costs and other expenditures that are incurred at a very high level of the organization will not necessarily be allocated to individuals who operate in lower levels of the organization. In fact, it may be that certain costs cannot be assigned, given the present internal organization of the firm. This will occur where there are two or more people jointly responsible for the incurrence of certain cost items. In such cases, effective control can only be established by changing the organizational pattern to remove this joint responsibility. If this is deemed to be a more costly move than is warranted in light of the possible benefits to be achieved from controlling these cost items, it probably is better to recognize that some incurred costs aren't worth bothering about. There is a great temptation on the part of accountants to say that all costs should be assigned to some product or some department. However, if the responsibility for the cost does not rest in the particular department, very little control will be gained by an arbitrary allocation.

3. Comparison. The third phase in the control system is one of comparison. It has often been stated that the essence of control is comparison and obviously what is intended is that the planned index must be compared with the actual index, and the operation will be considered to be in control if a significant variance does not exist. Conversely, if the comparison process shows that a large variance does exist, then things are out of control and this gives rise to the fourth phase in the control process.[1]

4. Explanation of Variances. This is a very important part of the control system, and, unfortunately, it is one that has received very little attention. There is a decision that has to be made at this stage of the control process, and that decision is whether or not to investigate and explain the resulting variance. Obviously, it would be better not to investigate the variance if nothing could be done about it and if no useful information would result from investigation. On the other hand, if the variance could be eliminated so that costs would be lower and profits would be higher in the future, or if investigation shows that the plan was wrong, so that there are some real advantages to be gained by revising the plan, then, obviously, the management would like to have the variance explained. This problem is probabilistic in nature. There is some positive probability that no useful information will be gained through the investigation process. On the other hand, there is a cost of investigation and the decision maker has to weigh the expected gain from investigation against the cost of investigation. If the expected gain is higher than the cost, investigation should take place. If the reverse relationship exists, it would be far better not to investigate the variance.[2]

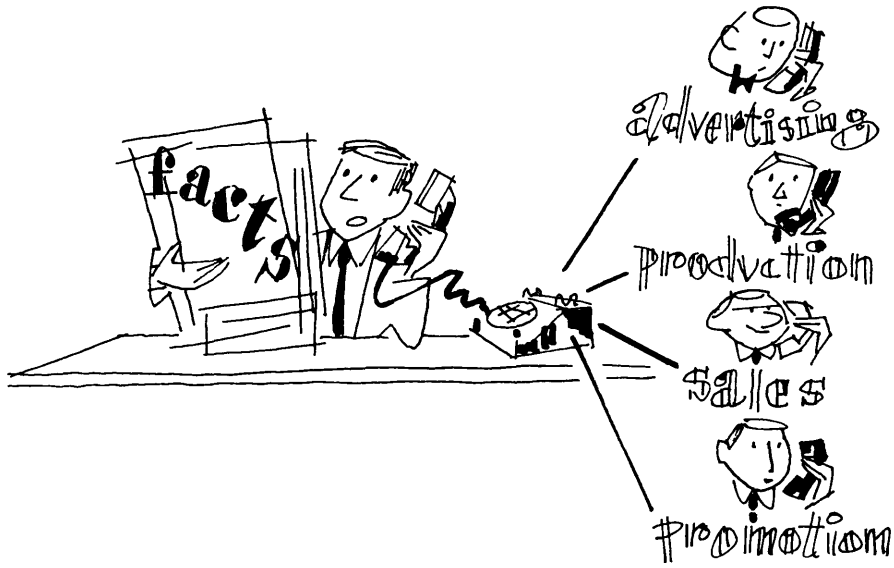
To the extent that the control process is carried out through the accounting system, the responsibility of the accountant in this regard is to analyze variances in such a way that a basis for corrective action is provided. In other words, the report that goes to the manager should be in such a form that important variances are explained so that the manager has a reasonable chance of taking the proper corrective action. This leads to the next phase in the control system.



5. Corrective Action. The fifth step in the control system is to take corrective action, if such is required. Now this should be thought of in its broad sense. If it is possible to eliminate the variance in the future, there will be a cost savings and thus higher profits will accrue to the firm. If this is the nature of the variance, then the management is charged with the responsibility for taking the corrective action. Suppose, on the other hand, that conditions have changed so that the only corrective action that can be taken is to revise the plan with respect to the future. Many people have the idea that if investigation shows only that the plan was wrong, it has not

[1]Although most of the discussion that follows uses illustrations of unfavorable variances, we do not mean to imply that favorable variances should not be investigated. Investigation of favorable variances may reveal new and improved production methods which can be applied elsewhere in the operation, thereby reducing costs and increasing profits. Also, investigation of favorable variances may show up standards which were too loosely established at the outset and thus require revision.

[2]For further development of this concept, see Harold Bierman, Jr., Lawrence E. Fouraker, and Robert K. Jaedicke, "A Use of Probability and Statistics in Performance Evaluation," *Accounting Review*, July 1961, pp. 409-417.



Feedback of information for planning purposes is the most important—and most frequently overlooked—step in control.

been worthwhile to investigate. This is a popular misconception which leads us to the sixth, and last, phase of the control system.

6. Feedback of Information for Planning Purposes. This, in our opinion, is the most important step in the control system and is the step that is most frequently overlooked. Up to this point, control has been discussed in its traditional form as being mainly a process of performance evaluation. With the exception of the planning that goes on in Phase 1 and the hint of corrective action to revise those plans in Phase 5, the plan was never used again except as a measuring stick against which to compare what actually had taken place. To be sure, this is important, but so is the planning problem. This is the point where the control loop can be closed by considering the effect that actual historical performance has upon future planning.

It is not unusual to find that when budget and actual performance comparisons are made, a variance may result which is noncontrollable. This usually means that it is impossible to do anything about the variance and if this variance is expected to continue, it usually means that the original plan was wrong. To view this as a nonsignificant finding, as is sometimes done, destroys much of the planning power of the budget. This point is a crucial one and will be considered in some detail.

As stated before, a large part of decision making is nothing more than reacting to changed conditions and anticipating other conditions that may change in the future. If the economic situation changes, the quicker the reaction of the decision maker, the better should be the profits of the firm. Hence, there is usually a high premium on anticipating correctly what is going to happen. Decision making, in this sense, is a process of making adjustments at the margin, or choosing a new strategy in light of changing conditions.

Unlike restrictive appropriation budgets such as are used for governmental units, there is nothing inherent in business budgets which prohibits the flexibility of alternate plans, if such alterations are appropriate because of changed conditions. One company emphasized the importance of this "flexibility" as follows:

"We believe that budgets should be a tool to be used in achieving better operating results. We have found the preparation of plans for the coming year to be one of the most valuable contributions budgeting can make to our operations. We have no hesitancy in making decisions which will result in variances from the budget if circumstances warrant such an action. We have learned such special actions are on a better foundation because of the earlier planning process."[3]

There are large profits to be gained by making the day-to-day operating adjustments quickly and correctly. To take corrective action is a form of decision making. However, it is a moot point as to whether there are larger savings to be gained in eliminating a cost variance or whether the significant profit dollars occur through making price adjustments, product and factor combination adjustments, etc., as these adjustments are called for because the conditions under which the firm operates have changed. Whatever the answer to this question, it certainly goes without say-

[3]Neil W. Chamberlain, *The Firm: Micro-Economic Planning and Action* (New York, McGraw-Hill Book Co., Inc., 1962), p. 83.

The control system should anticipate problems before they develop . . .

ing that it is important for the decision maker to have every bit of help that the budgetary accountant can give him. The feedback phase of the management control system can provide the needed help.

One excellent description of how an effective feedback control system can work is furnished by E. B. Rickard, who describes an example taken from the system used by Ford Motor Company.[4] Basically, this control system is project oriented, and Rickard describes an example assuming that the project is the 1964 Galaxie automobile. The planning cycle begins in 1958 with the basic market research and planning, and continues through the new model launching which is scheduled for September 15, 1963. The initial plan for this project consists of estimating costs, revenues, return on investment, etc. This preliminary planning phase is carried on until management is satisfied that the plan, as made at the conception of the project, is financially sound and attractive. The basic objective of the system is summarized by Rickard as follows:

"The objective of our control system as it relates to decision making is to determine the profit effect and the degree of financial risk involved, evaluate the attractiveness of available alternatives, assure that all the reasonable alternatives have been explored, that the representations made by the supporting offices are appropriate, attainable, and are recorded as commitments which those offices will be expected to achieve."[5]

It is interesting to note that the assignment of responsibility (as was pointed out in the description of Phase 1 of the control system) is mentioned by Rickard in no uncertain terms.

After the plan has been made and the financial commitments by the appropriate offices have been accepted, the next step is to compare actual results with planned results and then to restate or revise the plan for the remainder of the project period in light of the additional information provided. It is important to note here that the *anticipated* results of the remainder of the project are restated and revised so that these data might be used in future planning.

The resulting variances are corrected, if possible. That is, if there are under-runs or if the program is lagging, every effort is made to correct the situation so that things might proceed more in line with the original plan.

However, as Rickard reports, if this sort of corrective action fails, all aspects of the program are subjected to an intensive review to offset the unfavorable variances by taking action in other areas of the program. We would take this to mean, for example, that certain design changes might be made to offset high costs in other areas of the program, if this action would preserve the profitability of the project without changing the quality and acceptability of the automobile. He points out that, with respect to performance evaluation, there is an attempt made to determine far enough in advance what the performance will be so that changes can be made if the management does not like what it sees in the projection of future activity. The attempt here is to *anticipate* problems before they actually happen so that management is ready to adjust to changed conditions quickly and easily. The emphasis is on accounting for the future of the project, not the past.

The balance between performance evaluation and the use of the system for replanning decisions is summarized by Rickard as follows:

"We try to be realistic in the sense that if somebody will obviously fail to meet his commitments and management has in effect agreed that the deviation is unavoidable, we modify our plans accordingly. However, we try to assure that the decision to depart from the plan gets proper review and approval. We don't cavalierly disregard the commitments that people have made. We try to hold their feet to the fire if it appears at all reasonable."[6]

The above description clearly indicates that the control system is used to evaluate performance and to identify trouble spots in the project. However, the emphasis is on future project planning. There is an attempt to project the consequences of unavoidable variances and to replan the project so as to preserve the profitability of the project.

The effectiveness of this action depends to a large extent on the ability to measure the impact of external and internal changes on the entire project. Direct effect of a change is frequently readily apparent. However, failure to recognize all of the interactions resulting from the change can result in poor management action. Programs may be continued beyond their satisfactory cutoff point if changes that make competing projects more desirable are overlooked. Resource input changes which result in either shortage or under-utilization, both costly to a business enterprise, may be overlooked.

For example, consider the effect of a substantial manufacturing cost variance on the future cash position.

[4] E. B. Rickard, "The Past Is History . . . The Future Is Planning," *The Controller*, October 1962.

[5] *Ibid.*, p. 500.

[6] *Ibid.*, p. 501.

It may be, for example, that the actual production cost of a product turns out to be a good deal more than was expected when the standard was set. On investigation, it may be that the variance is unavoidable (perhaps because of a raw material price change) and that it can be expected to occur again in the future. As a result, by the end of the operating period additional outside financing may be necessary to carry higher seasonal inventories and accounts receivable, etc. A revised budget, using feedback information, may alert the treasurer to this financing need well in advance. If so, this information certainly should be a great deal of help to the treasurer in reacting rapidly to the problem.

Computer's Potential Impact

No discussion of an integrated management control system could be complete without some comment on the potential of the computer. There are at least two major phases in the management control system in which the large memory facility and rapid computational abilities of a computer can greatly improve the system's effectiveness.

In the first place, it is necessary that the management accept and approve the plan before the control cycle can begin. After the comparison and investigation phases of the control cycle, it is necessary that information be fed back to the planning group for use in drawing up and revising future plans. Two separate problems are suggested by this characterization of the control system. The first occurs at the time the basic plan is accepted and approved. In view of the uncertainty that surrounds the usual business operation and in view of the complexity of most business operations, how does management know which plan will best meet the long-run (profit) objectives of the company? This is a difficult question to deal with, and yet a control system is only as good as the basic plan. Hence, management needs all the help it can get in choosing and approving the basic budget plan.

The potential of the computer in helping to solve this problem lies in the use of the computer as a simulator. In concept, it is possible to view the budget as a set of external and internal economic relationships which, when programed for the computer, form a simulation of the firm. This simulation would be a budget "model" of the firm. The model would contain statements on the production constraints for the various producing departments, market constraints for the various products sold, etc. The model would be stated in general terms so that the impact on profits of alternative plans could be tested. The important use of such a simulation lies in its ability to allow management to experiment with different alternatives prior to the actual decision of adopting a specific plan.

If it is possible to capture the budget in a computer program as described above, the potential of the computer in seeking a better solution to the budget approval problem is probably obvious. In the first place, the computer simulation could be used to test out the effect of several different alternatives and several different management actions, a procedure which is not feasible in most traditional budgeting systems. It may be that, in addition to having a better grasp of the impact of different courses of action, the management might be able to eliminate certain alternatives because they are clearly inferior to other choices that are available. In addition, a budget simulation might make it possible for the management to try out certain measures as a way of turning an unprofitable operation into a profitable one. It should be emphasized that the computer cannot make the final choice of the basic plan for the management, nor can the computer remove all the uncertainty about future operations. However, the real power of any quantitative analysis is to help remove as much uncertainty as possible and to establish the relationships between operating variables so that management has a better grasp of the economic situation. As an example, it may be that management does not know the demand relationship for its products; however, it will help to know the various price-quantity relationships which *must* exist in order for a product to earn the required profit. Such a relationship would be established by using the budget simulation. It is one thing to ask a sales manager, "What will the sales be?" and quite another to ask him if it is possible to sell more than 10,000 units at $5 per unit! The latter question should be much easier to answer. Hence, budget simulation might help to narrow the range in which the amounts have to fall in order for a plan to be an attractive one.

The second key control problem occurs at the feedback point in the control system. Useful feedback information imposes two important requirements. The first is that the data must be processed quickly and accurately. That is, the necessary budget revisions must be readily available to the management at all times. The other requirement is that the budget itself must represent a complete plan of the firm for the future. The plan must be complete in that all constraints on all departments, etc., must be a part of the budget. When the signal is received that conditions have changed, the impact of these changes on decisions for all parts of the operation must be determined. It is only through

If control systems can exploit its information feedback aspects, the budgetary process can become an accounting for the future.

this type of rapid and complete revision that feedback information will allow the management to anticipate and react to problems. Notice here that the emphasis is on revising plans for the future; the past is important only insofar as it is useful in predicting the future.

The computer budget simulation should be very useful in meeting both of these requirements. Because of the data processing speed, quick revision of the budget resulting from changed conditions should be possible. Also, to the extent that the computer simulation is a complete plan for the firm, the future impact of present changes throughout the operation should be readily available. Obviously, the revised projections will only be as good as the program simulation itself. We do not mean to suggest that the data are going to improve simply because the processing is being done by machine rather than by a manual process. The familiar term GIGO (garbage in—garbage out) applies here. However, to the extent that the simulation is complete and the revision is rapid, the impact of changes throughout the system will be apparent.

The above discussion of budget simulation via the computer may appear to be in the class of ivory tower dreams and quite far from anything which is capable of being put into practice. Computer simulation takes place at various levels of sophistication. There is no need to have a "perfect" and "complete" simulation of the entire firm before this method will pay off. A complete simulation is probably possible in concept only. However, the complete simulation of a budget is a goal toward which we can move—a simulation short of this goal should be an improvement in the budgetary process as we know it. There is certainly evidence in the literature and in company practice which suggests that this idea is not as new and far-fetched as it may first appear.[7]

Summary and conclusions

In order for accounting to be an important tool for management, it is necessary that the system be future oriented. Information about the past is useful only if it can be used as a basis for establishing future plans. Budgeting is a powerful technique for performance evaluation. But, it is necessary to realize that information on past or historical variances (between budget and actual) is useful only insofar as it can be used to make future decisions. Management needs an indication of when economic conditions have changed and also needs data to help anticipate change. Variances which are produced in the budgetary process provide a set of signals which can be used to indicate the extent of change that has taken place. This information will be vital to management in planning for the future. Management control systems must be structured so as to exploit the information feedback aspect of budgeting. If this is done, the budgetary process can be viewed as an accounting for the future.

[7]For example, see R. Clay Sprowls, "A Computer Simulated Business Firm," *Management Control Systems* (eds.) D. G. Malcolm, A. J. Rowe, and L. F. McConnell, Proceedings of a symposium held in Santa Monica, California, 1959 (New York: Wiley, 1960). Also, Richard Mattessich, "Budgeting Models and System Simulation," *Accounting Review*, v. 36, July 1961, pp. 384-397.