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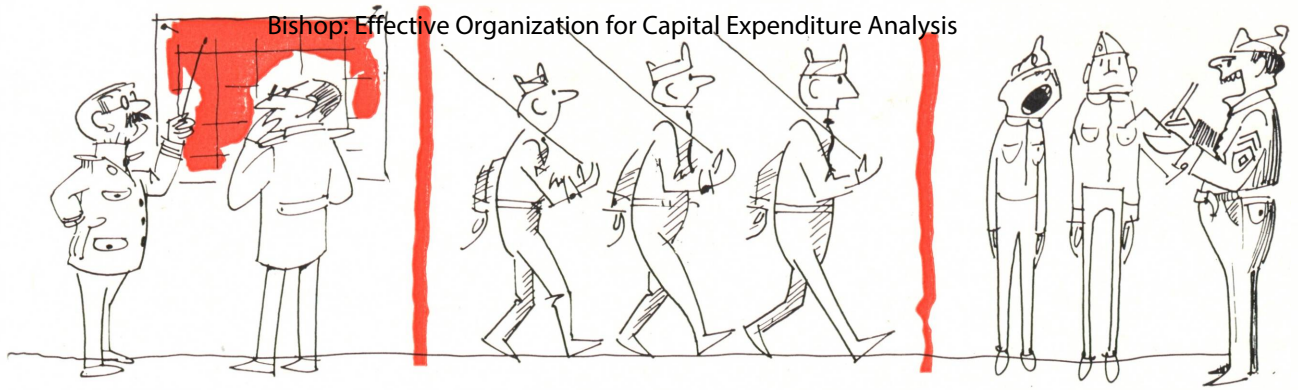
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Planning, organizing, and controlling are vital management functions—in business as well as in the army. But, unlike the army, business may profit greatly by actively soliciting help from its rank and file.

*Capital expenditure is a management responsibility, but when it comes to improved work methods or equipment, the best program is often one based heavily on employee suggestions, screened and evaluated in a sequential evaluation process —*

## EFFECTIVE ORGANIZATION FOR CAPITAL EXPENDITURE ANALYSIS

*by Bill J. Bishop*

*University of Missouri*

**F**EW DECISIONS in a business have consequences as serious as those involved in the acquisition of fixed assets. The impact is not limited to the immediate financial drain. The acquisition of a fixed asset has a continuing (beneficial or detrimental) effect on the business throughout the economic life of the asset, which may range from as little as two or three years to as much as thirty or forty years.

Much attention has been given to sophisticated methods of evaluat-

ing proposed capital expenditures. Regardless of the analytical techniques used, however, a capital expenditure program cannot be effective unless it is properly planned and organized.

In any but the smallest company top management cannot initiate all the ideas and make all the decisions itself. Because of the pervasiveness of capital investment decisions all levels of the organization must become involved in them. This requires careful assignment of

responsibility for planning and controlling capital expenditures through an organization structure that is utilized and understood by everyone who will be touched by the capital decisions.

### **Responsibility**

The ultimate responsibility for capital acquisitions is, of course, top management's. Major investment decisions, because of their magnitude and their long-term ef-



A basic objective of the organizational phase of a capital additions program is to ensure that management is aware of all worthwhile investment ideas.

facts, must be made by top executives and/or the board of directors. Furthermore, the entire capital expenditure program must have the active support of top management if it is to receive the necessary cooperation from employees.

This does not mean, however, that top management must make every investment decision. Minor ones can, and indeed should, be delegated to lower levels.

In many companies far too much top management time is devoted to relatively minor investment decisions. This practice is not only uneconomic but may keep the top executives from giving sufficient attention to major expenditure proposals. It is much better to specify a series of successive expenditure limits below which decisions may be made at successively lower levels of the organization.

### Staffing

The ideal equipment program is run by a specialist. Most equipment proposals require technical analysis. This task is often handled by engineers as a sideline to their primary responsibility, but there is risk that a given proposal may not

receive the consideration it deserves because of departmental bias or the pressure of the engineers' other duties. It is preferable, if the company is large enough, to employ someone whose primary duty is equipment analysis.

Many large companies have such staffs. They examine old equipment at regular intervals<sup>1</sup> and record for future reference information on its age, condition, current effectiveness, and the like. The capital additions specialists also keep informed of the latest equipment developments through review of periodicals, visits to equipment shows, and contacts with salesmen for equipment manufacturers.<sup>2</sup>

The presence of personnel who are familiar both with existing equipment and with the alternatives available helps to ensure that all the information needed for an investment decision will be available without undue delay. In their absence, it is difficult for management to be sure that it is considering all possible choices.

### Replacement policy

Initiation of equipment replacement should not be left to the discretion of the department concerned. The replacement program should be based on a systematic approach.

Normally existing fixed assets should be surveyed and examined at least annually.<sup>3</sup> Older equipment should probably be examined even more frequently since older items are more likely to become obsolete or inoperative. Even recently acquired equipment, however, occasionally can be replaced with more profitable types. Equipment manu-

facturers continually strive to improve their products. Thus, the latest equipment should be given a chance to compete, at least on paper, with that already in operation.

Obviously, the results of these examinations should be recorded and filed where they will be readily available when equipment decisions are to be made. Other types of information also may be utilized in the equipment program. Such data as historical records of maintenance costs and statistics on operating performance of a machine, amount of wasted materials, and idle time may be useful in equipment analysis. The extent to which such data are needed will vary in specific cases.

### Sources of new proposals

Systematic attention to replacement is an important element of efficiency. The real opportunities for increasing corporate profitability, however, lie in new investments.

A basic objective of the capital additions program, therefore, should be to make sure that management is aware of all worthwhile investment proposals. The opportunity to make profitable investments tends to vary directly with the number of proposals. All reasonable projects—not just those that are obviously desirable—should be given adequate consideration, and this policy should be communicated to every employee.

Rank-and-file employees should be encouraged to participate. In most companies employees probably consider origination of ideas for new fixed assets to be a responsibility only of management.

This is true of some types of proposals. Usually capital additions required because of expansion programs should be developed by executives or by equipment specialists. Requirements arising out of new products or invasion of new marketing territories are also likely to originate at managerial levels.

But many ideas for cost-saving

<sup>1</sup> Joseph Geschelin, "A Progressive Machinery Replacement Program," *Automotive Industries*, July 15, 1950, p. 32.

<sup>2</sup> Henry D. Sharpe, Jr., "Replacement Formulas—Are They a Help or Headache?" *The Tool Engineer*, August, 1953, pp. 43-44.

<sup>3</sup> D. M. Pattison, "Choosing New Machinery and Equipment," *Mechanical Engineering*, September, 1952, pp. 716-720.





Employees should be convinced that suggestions are important and are part of their responsibility to the firm.

devices — and many replacement proposals — can originate with lower-echelon employees if they are encouraged to offer them. It is worth a major effort to convince rank-and-file workers and first-line supervisors that new equipment ideas are not a management monopoly but are a part of their responsibility. Suggestion systems, with generous and highly publicized awards; departmental meetings on equipment problems; and, above all, continuous encouragement by workers' immediate supervisors are useful techniques.

More is involved, however, than simply provoking ideas. There should be a mechanism for helping the workers to communicate their suggestions effectively. Factory workers normally are not trained to communicate in dollars-and-cents terms.<sup>4</sup> They need staff help to ensure that profitable proposals are not overlooked simply because an employee is unable to present an idea in a convincing manner.

Management must be careful, too, to handle suggestions, even poor ones, in a positive and encouraging way. An employee whose idea is summarily rejected is much less likely to spend time and effort developing ideas in the future, particularly if he thinks that his proposal had real merit that was ignored. Employee suggestions should be carefully screened through a formal review system.

<sup>4</sup> "Is New Equipment Worth Its Cost?" *Business Week*, February 18, 1950, p. 86.

The basic procedures are shown in the exhibit on page 54.

### *Preliminary stages*

Informal screening of a proposal that originates with operating personnel begins in the early stages of its development. An employee's enthusiasm about his idea usually leads him to discuss it with his family, friends, and fellow workers. The opinions of the last group are likely to be especially valuable, since the co-workers are familiar with the problems and equipment involved. Clearly undesirable ideas are not likely to survive this stage of screening—an advantage to management, which is thus spared the necessity of rejection. There is risk, of course, that good ideas may be eliminated without adequate consideration of their merit, but this risk is unavoidable.

The next basic step in the screening of an operating employee's idea is normally for him to present it to his foreman or supervisor. At this stage the idea will probably carry no price tag, and the foreman will probably not attempt a detailed cost vs. benefit analysis. He should, however, be close enough to the equipment and the work it performs to be reasonably proficient in making a preliminary evaluation of a project.

Subsequent stages in the development of an idea vary with corporate size and organization structure. A proposal must be "sold" to various persons at various levels of the management. In general, however, the process will include

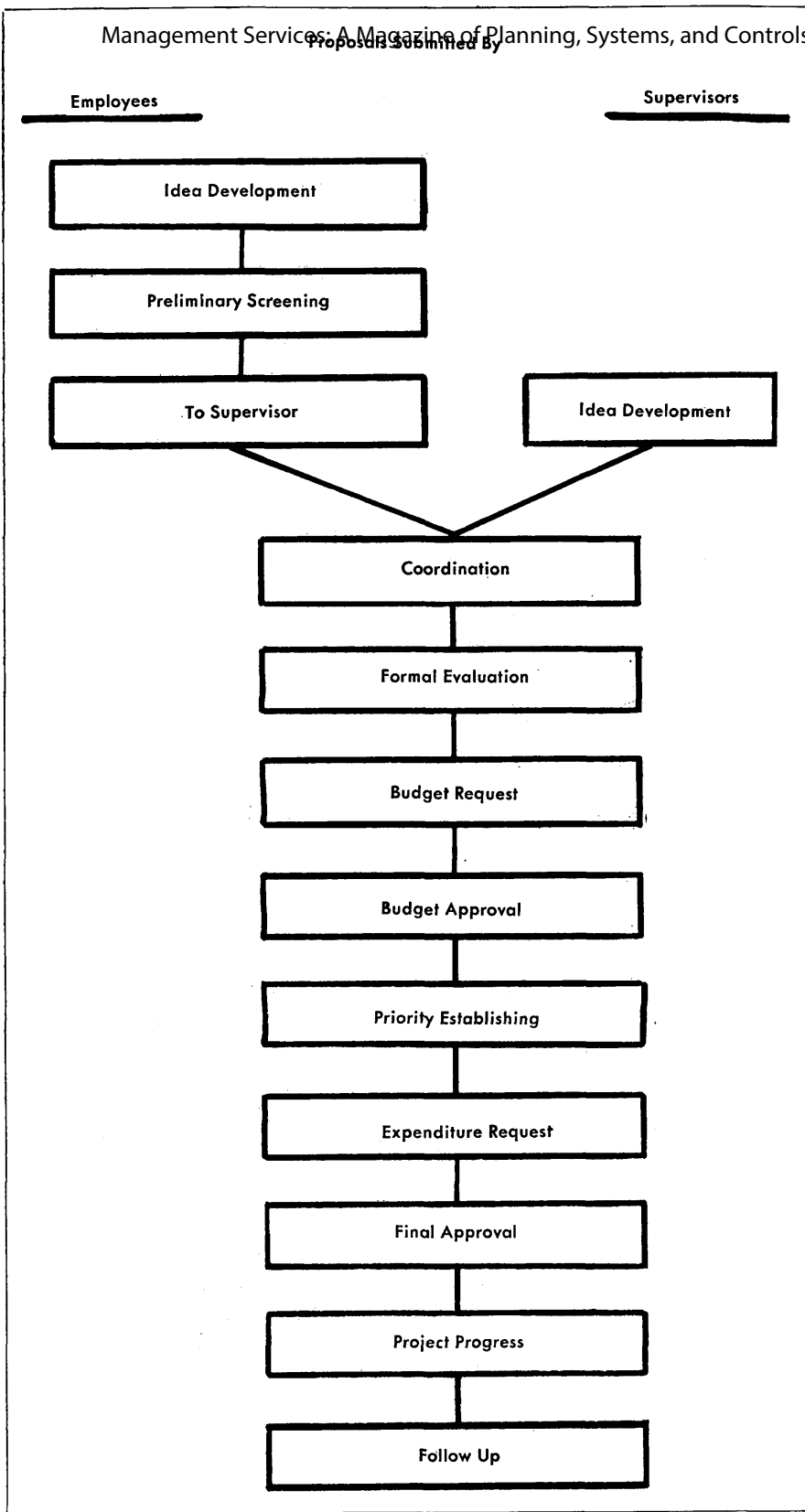
the stages of coordination and formalization, formal evaluation, budget request, budget approval, priority assignment, expenditure request, and final approval.

The proposal now must be presented to a department head or, if one is available, an equipment specialist so that it can be analyzed in terms of future costs, future revenues, and other data that will be pertinent to the final decision. Cost estimates should include the actual purchase price, freight and installation costs, and such miscellaneous expenditures as the cost of trial runs. The life of the equipment should be determined as accurately as possible by examination of historical data on similar types of equipment and by collection of information from equipment salesmen. Experience with similar equipment also may be helpful in estimating maintenance, repair, and operating costs. Salvage value, often ignored, should be estimated if possible.

All this should produce a rough estimate of the profitability of the proposal. A department head



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Steps in Handling Capital Addition Proposals

should have the authority to reject clearly unattractive projects at this stage.

Before a department head submits a proposal to his superior, he normally should review the profit-

ability calculations and the advantages and disadvantages of the project with someone qualified to give an opinion. This might be one of the company's equipment specialists, if they exist, or an en-

**Formal evaluation**

The proposal should receive a formal evaluation in the format specified by company policy. Uniform application of a consistent evaluation method is essential. Comparisons of return on investment among competing projects will be valid only if the same evaluation concepts are used in all cases.

Obviously, the data used in evaluation must be accurate as well as consistent. The department head must be alert to possible errors that will lead to mistakes in judgment. He must know, for example, how to interpret data on the usable output of new equipment. Usually a machine has a specified theoretical capacity, which frequently is verified through trial runs in the vendor's factory. The purchaser should be wary of accepting theoretical capacity at face value, however; because of down time and repairs actual capacity may be only 75 per cent or 80 per cent of theoretical.

**Profitability must be judged**

The department head also must not ignore such basic questions as whether the company needs the increased capacity a proposed asset will supply. Unless the salesmen can market the increased output, added capacity will be a handicap rather than an advantage. At best, there is likely to be a time lag; the new capacity may not be really useful in its first year or two.

If the department head has profit responsibility, failure to make a thorough analysis may jeopardize his own operating results. Even if he does not, he must attempt to consider all relevant factors before making a recommendation; a carelessly evaluated proposal is not likely to win acceptance.

A proposal that survives the department head's formal evaluation will be included in the requests for

capital additions that he presents to the budget committee. All such requests from all department heads are normally re-evaluated and coordinated by the budget director. The budget director's own attitude must be unprejudiced, not subject to his personal friendships with department heads. A standardized format for evaluation and support of proposals is helpful in ensuring objective rating and ranking of proposals.

**Assigning priorities**

After the budget director's examination of the proposals, they are presented to the budget committee. The membership of this committee varies among companies. The budget director himself and the president are almost always members. Since a majority of requests for capital additions originate in the plant, it is usually desirable to include a representative of factory management. Normally, too, there is a representative of the financial organization.

All projects recommended by the budget director and the budget committee will presumably be worthwhile in terms of the criteria by which they have been screened. Not all, however, will be equally urgent or equally profitable. Furthermore, the total to be spent for capital projects in the period under

the budget director or budget committee to make but for top management and the board.

Before the capital budget is submitted for top-level approval, therefore, each project should be assigned a priority rating. Priorities should be assigned on as objective a basis as possible, although often objective data will have to be supplemented by subjective information.

Projects may be ranked in the order of necessity; for example, if an old machine is functioning poorly or is completely inoperative, it may need immediate replacement. Projects also may be ranked in the order of their profitability. The data on which the rankings are based should be included with the other information in the budget committee's report, for the actual priorities will be determined by top management and/or the board of directors.

**Approval**

The level of responsibility for the final decision on major capital additions varies among companies. In some cases the chief executive officer may make the decision; in others final authority is reserved to the board of directors or the executive committee.

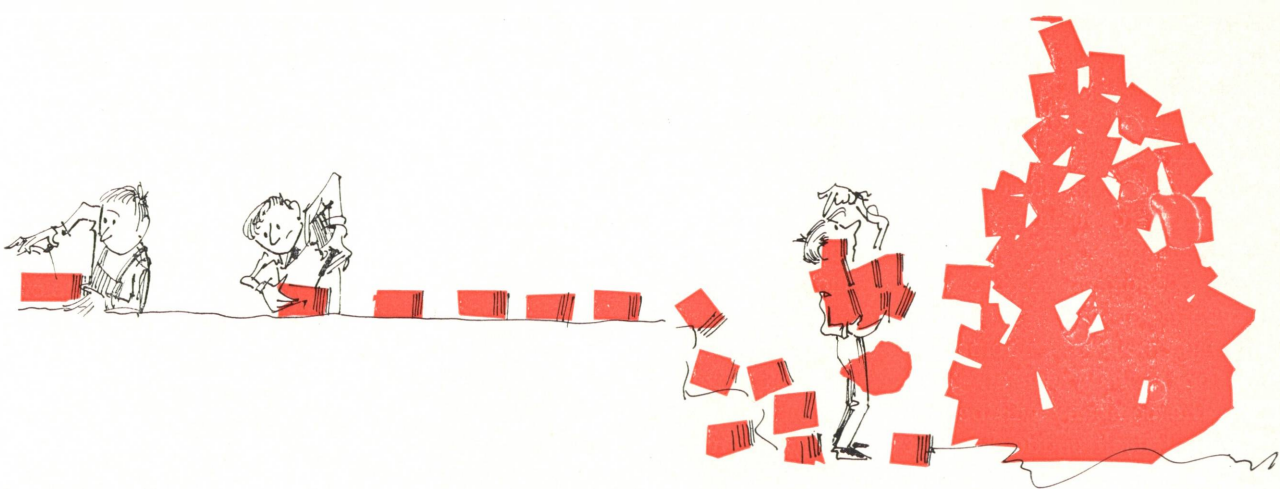
The budget committee's recom-

mendations may or may not be accepted by the chief executive or board. Much depends on how closely the budget director and budget committee are in tune with board thinking on major policies. Major policy decisions, which frequently have a strong impact on the capital budget, usually emanate from board meetings. Policy changes occasionally may result in major alterations in the capital budget, for example, in case of a sudden retrenchment or a decision to embark on a major expansion.

**Expenditure authorization**

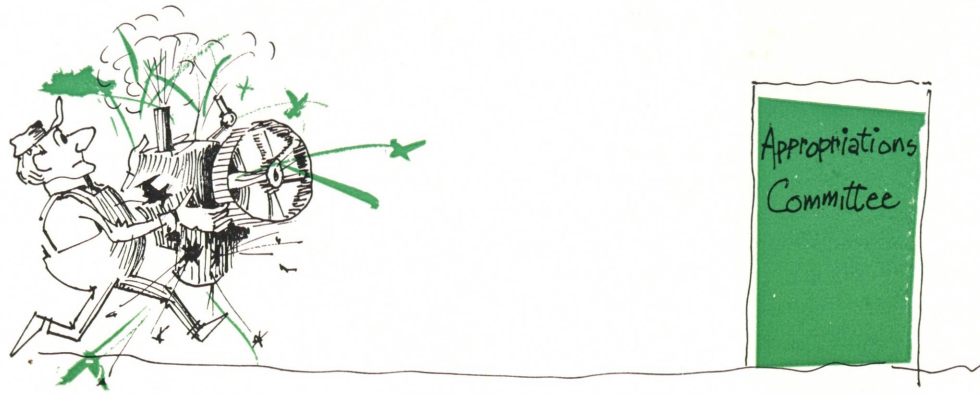
Although all items incorporated in an approved capital budget are intended for acquisition in the budget period, not all require immediate expenditures. Some may be approved with specific starting dates; others may not. Frequently it is up to the department head who originally supported the project to initiate its execution with a request for expenditure bearing his signature.

Frequently an expenditure request for an item already authorized in the capital budget requires little further processing. It may need the signature only of the budget director, controller, treasurer, or some other executive in a position to know whether execution of the capital budget is to



A department head must always be aware that capacity of a proposed asset may not be needed by the firm.





A replacement asset may be essential immediately if an old machine functions poorly or is inoperative.

proceed according to plan or whether a retrenchment is in the offing. Sometimes, particularly in a company where the president delegates little authority, the president's own signature may be required.

The final signature affixed to the application transforms it into an official authorization. Copies of final authorization forms should be given to the department head, the purchasing agent, and others who need this information.

### **Progress reports**

During the construction or installation stage of a project management should receive frequent reports on costs, comparing actual expenditures to estimated ones. This is particularly important in the case of projects that require months or even years to complete.

It is essential to let management know promptly when cost to date indicates that overall expenditures will be greater than originally anticipated. If warned in time, management may be able to take corrective action—to scale down the project, perhaps, or to institute balancing economies. At the very least, reports of overages should alert management to anticipate a squeeze on cash. With an early warning, the company will be less likely to find itself suddenly short of funds.

To ensure that cost and return on investment calculations are

valid, accountants should take care to see that unrelated costs of other items are not charged to the capital addition. Outlays for expenses incurred at the same time or in the same location, but not as part of the project, may be added erroneously, either intentionally or unintentionally, to the project's account. Thus, the accounting department should be notified immediately when each stage of a project is completed in order to forestall additional, unrelated charges.

### **Follow-up**

Even when relatively sophisticated criteria and procedures are used in the evaluation of investment proposals, a surprisingly large number of companies fail to follow up to see whether the forecast cost savings or revenue increases were actually achieved. There should be a regular procedure, as standardized in format as the authorization procedure, to review the results of each project after it has been in operation for several years.

Accountants, working closely with the department heads, equipment specialists, and the budget director, should be able to provide figures indicating the profitability of a capital addition. These data should be scrutinized closely to determine whether the project has actually produced the indicated return on investment. Such follow-ups will enable management to evaluate the effectiveness of the

overall capital budgeting program as well as of individual projects.<sup>5</sup>

The organization for equipment analysis proposed in this article is not assumed to be applicable in detail to all companies. Small companies may not be able to afford the specialization indicated; large companies may profit from even further specialization. However, the basic steps discussed, regardless of the extent to which they are formalized, are common to all capital investment programs: proposal initiation, coordination, formal evaluation, budget request and approval, priority determination, expenditure request and approval, progress reports, and follow-up.

Each company must develop its own organization, tailored to its own characteristics and requirements. The structure outlined here may serve as a framework for analysis.

It is difficult to overstate the need for an effective organization for capital expenditure analysis, utilized and understood by everyone in the company who is affected by capital decisions. A properly organized capital addition program should do much to orient management's thinking where it belongs—toward the future rather than the past.

<sup>5</sup> Robert W. Blosser and John D. Archer, "Machine Replacement Program Saves \$125,000 Yearly," *Factory Management and Maintenance*, June, 1954, p. 114.