APPLICATION OF ZERO-ONE PROGRAMMING TO THE MAKE-OR-BUY DECISION

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CHAPTER I

INTRODUCTION

With the advent of technological changes, the scope of problems encountered in industrial firms has broadened and correspondingly presented management with more decisions of a higher degree of complexiety to be made. In this report a specific type of decision is studied. Usually when a firm enters into a contract with the government a tight money situation exists. That is, profits received tend to be low from the contracts for the performance of certain services for the government. It also implies that fiscal year budgeting is a difficult task. Typically the budgeting is established for the current budget period but is forecasted for future budget periods. Thus when making a decision on the feasiblity of producing a particular product it is necessary to evaluate what resources required to manufacture the product need to be budgeted for. Also it is necessary to note what effect the resource allocation to one product has on the total system. Perhaps there are one or two resources when considering the total system, which are critical resources, and, as a result, exert much influence on the total system.

Sometimes because of critical internal limitations of a particular resource it is necessary to make a decision to have a product manufactured at an external source. Thus in addition to budgeting for the allocation of resources required internally the situation of external buying can influence tremendously the decision making process and correspondingly the total system.

During the last few years two factors have effected significantly the operations of most industrial firms, including to some extent, the firm mentioned above. The two factors are: (1) a rapid technological change, and (2) an increase in competition between firms. As a result, each year considerable expenditures are made by firms on investments (for the manufacturing of products), each of which probably has some expected future rate of return. Because of the amount expended and the long period of time before a return on the investment is realized, it is obvious that planning and controlling the expenditures on such investments is necessary to attain goals set by the firm in accordance with the two factors mentioned above. The planning and controlling of these expenditures on investments is the capital budgeting problem. Capital allocation is a direct result of capital budgeting. In this report each investment represents the planning and production for a particular product. The expenditures for an investment for the capital budgeting problem is the amounts required (or the cost of capital) if the product is to be produced.

It is necessary for the acceptance or rejection decision of an investment to have available some method or criteria for making that decision. A final decision of accepting or rejecting a proposed investment obtained through the decision making process signifies whether a product should be invested in. Usually when considering the capital budgeting problem past analysis and methods of obtaining the decision have been restricted to decision making for internal operations of a firm.

When considering an acceptance or rejection criteria an additional