

# **A MULTIPLE-PRODUCT SALES FORCE ALLOCATION MODEL**

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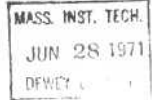
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**DAVID B. MONTGOMERY & ALVIN J. SILK & CARLOS E. ZARAGOZA**

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by  
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and  
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#### ABSTRACT

When several products are marketed by the same sales force, it frequently becomes impossible or impractical for salesmen to promote all items in the product line extensively in each and every time period. Management's problem is to decide how the available selling effort should be allocated across products and over time. The opportunity costs associated with using limited selling resources to promote certain products but not others must be evaluated. This paper describes a decision calculus-type modeling system for dealing with this question.

The problem is analyzed by a two-step procedure. First, a response function is defined which relates selling effort to sales and profit results in a manner which represents some behavioral phenomena considered to be important. An interactive conversational program elicits judgemental data from managers which are used to parameterize the response model. A separate response function is specified for each product in the firm's line by this method. The set of response functions so obtained becomes the input for the second component of the system, an allocation heuristic. An incremental search procedure is employed to find an allocation of the sales force's time to the various products and over several time periods which is "best" in terms of total contribution to company profits. The model is presented in the context of an ethical drug manufacturer's multiple-product sales force allocation problem. Results of an application are summarized and implementation considerations noted. A comparison of the model-based allocation with that determined previously by management indicated that the former plan would offer a substantial improvement in profits.



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## 1. INTRODUCTION

Most of the management science research reported to date on problems of personal selling has been concerned with some type of sales effort allocation decision. Given that the sales force available to a firm for some short-term planning period is typically a fixed and scarce resource, the basic management question to be answered is, how should the salesmen be utilized in order to maximize profits? In their recent review of this work, Montgomery and Urban [15] discuss a variety of models for allocating sales effort among customers and prospects, geographical areas or territories, and time periods (salesman scheduling and routing). This paper describes a model designed to deal with the problem of allocating selling effort along yet another dimension--across a firm's product line.

Firms marketing several products through a single sales force frequently find it either impossible or impractical to have their salesmen promote the entire product line extensively in each and every time period. Clearly, there is an opportunity cost associated with using the sales force to promote certain products while withholding this support from others. When a firm has numerous products and personal selling is a key element in its marketing mix, the effect on total profits of different allocations may be very significant and evaluating the trade-offs implied by alternative policies is not a simple task. Organizational factors may further complicate this allocation decision, especially in firms where the products are distributed among a group of managers for purposes of marketing planning and control. Faced with the well-known obstacles to measuring market response to selling effort accurately, it is scarcely surprising to find managers relying more on bargaining than analysis to resolve conflicts about how the sales force's limited time should be divided up among competing uses.

The system for allocating selling effort among a set of products to be presented here represents an example of the type of model which Little has labelled a "decision calculus"--"a model-based set of procedures for processing data and

