Model-Building in Marketing Research

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> The relationship between behavioral and optimization models should be more clearly understood. The authors define the characteristics of each, using published market research findings. They discuss the implications of the behavioral-optimization model dichotomy for the marketing research department, and suggest an organizational arrangement for using research data more effectively in management decision making.

The constantly increasing influence of a scientific approach to the study and practice of marketing, and management in general, is one of the most salient developments of our decade. There have been very few attempts, however, to relate the various developments to one another. The current literature is rich in reports of the application of operations research techniques, such as mathematical programming, queuing theory, and Bayesian decision theory, to marketing problems. Then there are the statistical model builders with their multiple correlation, maximum likelihood, and factor analyses. Concepts from the behavioral sciences, such as cognitive dissonance, selective perception, and opinion leadership—to indicate only three of the ideas contributed by psychology and sociology—are equally glamorous. No wonder many of us are confused by the volume and diversity of this new influx—the uncounted speeches, articles, and books that implore us to embrace some new and distinctively different concept or methodology.

The confusion generated by many voices often talking in seemingly contradictory terms has obscured the basic likenesses of the various “scientific” approaches. Proponents of the application of quantitative and behavioral concepts to marketing are really striving for the same goal. The objective of each, very simply, is to inject the scientific point of view into the management decision process. Their common argument is that problems must be attacked systematically, facts obtained by means of measuring procedures with known properties, alternatives evaluated as objectively as possible, and, finally, the results of problem-solving activity presented in a form that permits equally systematic analysis of outcomes, after the fact. Thus, each problem and its solution could effectively add to the storehouse of knowledge being accumulated by the firm and, hopefully, by the marketing profession as a whole.

A set of unifying principles is needed—a broad conceptual framework for relating these apparently separate scientific approaches and showing the relevance and domain of each’s importance. We hope to contribute to the desired structure by showing that the roles of the operations research specialist on the one hand, and the statistician, the behavioral scientist, and the marketing research analyst on the other, are mutually supporting so far as the solution of management problems is concerned. We shall also try to indicate the way existing marketing research departments can maximize their contribution to the use of scientific methods in marketing.

THE RELATIONSHIP BETWEEN BEHAVIORAL AND OPTIMIZATION MODELS

Applications of the scientific method to marketing problems can be grouped into two classes of study: (i) behavioral relationships and (ii) normative decision rules. Models of behavior reflect known or conjectured facts about the world. (We shall see that they may or may not stem specifically from the “behavioral sciences.”) They are designed to describe how individuals or firms do behave. Optimization models, on the other hand, suggest how economic units ought to behave if they are to achieve some explicitly stated objective, such as the maximization of profits. Separation of models into these two classes is an important step toward rationalizing the scientific approach in marketing.

The distinction between behavioral and optimization models can be better understood if we compare it with the similar dichotomy involving a business firm’s controllable and uncontrollable variables. In marketing, controllable or policy variables include the product, price, promotion, and channels of distribution. Consumer and trade behavior, and the factors that influence it, are generally considered uncontrollable by the individual marketing organization. A third class, criterion variables, can be defined in terms of the other two types:

Criterion = F (controllables and uncontrollables), where the notation y = F(x) is read “y is a function of
models from The price marketing (1) has been studied to find policies that will maximize profits or minimize costs. But it is not unusual for the operations researcher to find himself building behavioral as in the decision-making process. An optimization model is a behavioral model that is used to predict the behavior of a system or individual. For example, a marketing manager may use an optimization model to determine the optimal price for a product or the optimal advertising budget. The model is based on the assumption that the manager has access to all relevant data and that the results are statistically significant. However, the model may not take into account all factors that influence behavior, such as psychological or social factors. The model is also limited by the fact that it is based on historical data, which may not be representative of future behavior. Therefore, the results of an optimization model should be interpreted with caution.

Some Behavioral Models Reviewed

Perhaps the best known behavioral model to appear in the marketing literature was developed by Vidal and Wolfe (14), who studied actual sales results for selected products. The model, which was developed using data from a major manufacturer, aimed to identify parameters that could be used to predict future sales. However, the model was criticized for its reliance on historical data and its limited scope. Additionally, the model was not able to take into account the impact of new product introductions or changes in market conditions.

The Marketing Research Function

Marketing research departments have a vital role to play in bringing together behavioral models and optimization models. Their primary function is to ensure that the models are used in a way that is consistent with the overall business strategy. This involves identifying the appropriate scope of the research, selecting the relevant variables, and interpreting the results in a way that is meaningful to the decision-maker. The marketing research function also plays a role in developing and maintaining the models, as well as in training and supporting the users of the models.

The dilemma of self-confidence

One of the most important challenges faced by marketing research is the issue of self-confidence. Many businesses rely on the results of marketing research to inform their decision-making processes, but there is often a lack of confidence in the accuracy of the results. This can be problematic, as it can lead to poor decisions and a loss of trust in the research function.

The role of marketing research is to provide objective, evidence-based information that can be used to inform decision-making. However, the results of marketing research are often subject to a number of biases, including sampling error, non-response bias, and measurement error. These biases can make it difficult to interpret the results of the research and to have confidence in the accuracy of the conclusions.

The American Marketing Association (AMA) has developed a set of guidelines to help ensure the quality and reliability of marketing research. The guidelines cover a range of topics, including research design, data collection, analysis, and presentation. The AMA also offers training and certification programs for marketing research professionals.

The marketing research function is a critical component of the marketing function in any organization. By providing objective, evidence-based information, the function can help organizations make informed decisions and achieve their marketing objectives.
On the other hand, the behavioral model builder often does not need the level of mathematical ability required to find optimal solutions to particular decision problems. Learning the theory and techniques of statistical theory aside, the behavioral analyst uses mathematics as a language for the description and analysis of phenomena rather than as a method for the solution of complex mathematical problems. While sophistication is a must in one stage, the skills required for the former is much smaller than it is for the latter.

Finally, the behavioral model builder requires conceptual inputs from the behavioral sciences, and from the distilled experience of managers themselves. He must know how and where to find empirical data that are compatible with the postulates of his behavioral model. These requirements represent a fairly direct extension of the behavioral management's present role.

2. Optimization analysis can be more effectively handled outside the marketing research department. The rationale for this view is clear if the company in question has an organized operations research group. Members of this organization will be trained in the application of formal optimization methods to management problems. If operations research has not been applied to marketing problems in the past, progress in behavioral model building within the marketing research department should provide increasing opportunities for applications in the future. The differences between the skills required for handling the two types of models suggests that division of labor between the two types of approaches is in order. Of course there will be a strong need for continuing effective liaison between these two research groups.

The marketing research department's role in optimization analysis may be more controversial in companies where the existence of an operations research group, and its consequent, model-building, if he is to help management, get full mileage out of market research data.

How the marketing research department try to carry the modeling process? While the answer to this question depends upon the attitudes of management and the existence of the components within the company (e.g., an organized operations research group), and the readiness of the company's management to accept a plan that may very well change, it appears that marketing researchers should generally concentrate on behavioral rather than optimization models. There are two reasons for this view.

1. The resources required for building and testing behavioral models are more compatible with the skills traditionally associated with the marketing research function than are those necessary for work in the area of formal optimization. The independent behavior modeler must first of all have a working knowledge of the theoretical and descriptive statistics. Techniques based on regression, discrimination, and factor analysis are extremely useful in this kind of work, for example. He must have the ability to express relationships between variables in mathematical terms, and be able to deduce the behavioral implications of particular models. Use of the computer for statistical analysis and the exploration of complex models through simulation is rapidly becoming important.

REFERENCES