

Multiple Modeling Tools: Key to Sophisticated Database Marketing

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Last month's "Superiority of Tree Analysis Over RFM: How It Enhances Regression" discussed some important ways that tree analysis (CHAID, CART, and the like) can be used to segment prospect and customer files. We also showed how tree analysis can be valuable for companies that employ regression as the primary tool for predictive modeling, because of its ability to identify what are known as interaction predictor variables – the synergy in explanatory power that often results when multiple variables are combined.

We'll concentrate this month on another way that tree analysis can enhance regression models – as a vehicle for providing insight on how to tailor the promotional message to the characteristics of a given prospect or customer. In this approach, the regression model determines whom to promote. Then, the tree analysis provides insight into what the promotional message should be.

This two-step segmentation strategy is central to many state-of-the-art database marketing programs. To understand how, we need to first understand a basic difference between regression and tree analysis. We'll use one of last month's hypothetical examples to illustrate this difference:

Assume that we want to segment a customer file by response to a previous mailing. We'll start with a regression model to determine whom to promote. To keep matters simple, assume that the model contains the following six variable types: Months Since Last Order, Number of Orders, Average Order Size, Merchandise Categories, Age and Gender.

The output of our regression is deciles – ten groups of equal size. Decile 1 is comprised of the top ten percent of customers in terms of predicted future purchase probability, and Decile 10 the bottom ten percent. (Models can be comprised of any number of equal groups, depending on the circumstances.) Every customer who is scored by the model is evaluated on each and every one of the six variable types – unlike tree analysis, where multiple customer (or prospect) groups are defined by different subsets of variables. The model predicts future purchase probability as follows:

The Gender variable might apply points for women and none for men. Likewise, the Age variable might apply more points for older customers and fewer for younger ones. Every customer is interrogated for all six of the variable types. The higher the sum of the points across all of the variables, the greater the predicted probability of responding in the future

Because of these dynamics, regression deciles are heterogeneous; that is, a given decile contains customers with multiple characteristics. Decile 1, for example, will likely contain men and women, as well as the old and the young. This is because an extremely high “rating” on a given variable can more than counteract a relatively low “rating” on another variable. In fact, the inhabitants of a given regression decile have only one guaranteed similarity: their predicted future purchase probability.

What all of this means – again – is that regression is an excellent technique for determining whom to promote. But, because there is no guaranteed consistency of customer characteristics within a given decile, regression provides little insight on how to tailor the promotional message to the interests of each individual.

Tree analysis provides excellent insight into the appropriate promotional message for a given customer or prospect because it creates homogeneous groups; that is, a given decile contains individuals with identical characteristics. The following are two of the groups described in last month’s hypothetical example (along with their higher-than-average response rates):

- 40-50 year old female jewelry buyers, with four or more purchases, averaging \$500+, and at least one purchase within the past six months – 8% response rate.
- 30-35 year old male electronics buyers, with three or more purchases, and at least one within the past twelve months – 4% response rate.

The beauty of these two tree analysis groups is that – unlike regression deciles – they provide us with marketing insight. Feed these descriptions to a good creative staff and the result will be a brainstorming session on how to tailor the promotional piece to the demographic characteristics and product interests of each customer group.

There are many ways to tailor the promotional piece. Perhaps the simplest are ink-jet messaging and “blow-ins.” More involved techniques are over-wraps, customized covers, and “glue-ins.” The ones that require the most up-front investment are selective binding and specialty promotions. Sophisticated database marketers employ at least some of these techniques for just about every promotion.

Exactly how should tree analysis be combined with regression? Part of the answer is straightforward: build a regression model to determine whom to contact. The rest of the answer, however, requires some creativity.

One possibility is to build a tree analysis in which the potential predictor variables are limited to demographics and merchandise categories. These are the variables that are most likely to offer clues on how to match the appropriate promotional message to a given customer or prospect. Other variables – recency, frequency, average order size, and the like – are helpful for identifying those individuals who are most likely to respond. But they provide little insight into lifestyle or interests.

In order to implement this selection strategy within a production environment, a customer or prospect file is first scored by the regression model to determine whom to promote. Then, a series of “and”

statements – corresponding to the homogeneous tree analysis groups – is applied to those individuals who have been selected for promotion. Finally, an appropriate promotional message is targeted to each group.

To summarize, a regression model is just the first step in a state-of-the-art database marketing program. Other analytical techniques, such as tree analysis, must be included to determine how to tailor the promotional message to the needs of the individual.

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