PRODUCT CONFIGURATOR

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Consider a person who wants to buy a personal computer. A simple way to do it would be to go to the website of a computer manufacturer and essentially "build" a computer. The firm provides the options for various components such as monitor size and CPU speed along with specific prices. The customer can select exactly the combination desired, subject to a price constraint. When all of the offered options are considered, the consumer is choosing a specific computer that fits the budget from among several thousand computers. Yet the process can be completed quickly, efficiently and can be almost enjoyable for the customer. Would it be possible to use such a process for research? How would it work and what kind of results can we expect? This article deals with these issues through the use of a product configurator for research.

Product configurators in various forms have been historically used by firms to help their salespeople sell the right products to customers. With the improvement in computing power and the high level of Internet access in the general population, firms are increasingly allowing customers to "design" the products they want to buy. The same factors can be useful for researchers trying to understand consumer behavior.

A product configurator based approach to research is most appropriate when the product (or service) has multiple features with varying options. Conceptually this is very similar to the basic design

requirement in a conjoint analysis. [For a more detailed explanation of conjoint analysis, please refer to *Deriving Value from Research: The Use of Conjoint Analysis for Product Development*]. In conjoint analysis, products or sets of products are evaluated by respondents and the answers are analyzed to understand the importance of different features and options. This means an experimental design often has to be used to create the products and there are rules on how to construct the products and sets. Violations of rules can have a strong impact on the quality of the results.

On the other hand, a product configurator has virtually no rules. In the most basic version of the configurator, respondents choose the options they like and assemble a product that best meets their needs. Studying the choices they make allows us to understand what is important to them. Often a price constraint is included along with each option so that respondents do not automatically select the best option in each case. For example, in configuring a personal computer, respondents may face a choice between a 17-inch monitor priced at $100 and a 19-inch monitor priced at $150. As they keep making choices a running total of the amount of money they have "spent" is provided. Thus a respondent who wishes to spend less than a specified amount (say $1000) for a personal computer will have to make choices of features, such as monitor size, where price will have to be traded-

off with more desirable options of that feature.

Sometimes the nature of a product is such that a price constraint cannot be imposed for every feature or option. In such cases, respondents can be asked what price they would be willing to pay. Alternatively, a Van Westendorp pricing approach can be used to understand the willingness of people to pay for the product.

Are there any advantages to using this method over conjoint analysis? The primary advantage is in terms of flexibility. Conjoint analysis has to follow certain rules in terms of the number and type of features and options included in a study as well as the ways in which they can be combined. Since the configurator is not a statistical model, it does not have to follow any such rules. Logic dictates the setup of the process more than anything else. On the other hand, the specific type of results that conjoint analysis produces, such as utility scores and market simulation are hard to get in a configurator since an experimental design is not used. Therefore a configurator should be used appropriately with a good understanding of what it can and cannot easily do.

An Example

The purchase of auto insurance is a good research application for a product configurator. The product

is somewhat complicated, has multiple features and options and because of the individualized nature of the pricing, is hard to model by other methods. In order to study it using a configurator, the (six) features and options shown in Table 1 were selected. With input from industry experts, the approximate price associated with each option was estimated. First, respondents were asked how much they currently paid for their auto insurance. Then a basic auto insurance package was presented to them.

The basic product is a six-month auto insurance policy. It includes:

Comprehensive and collision coverage with a $500 deductible. The minimum coverage for bodily injury liability and property damage is mandated by the particular state. This provides $15,000 per person and $30,000 per accident coverage for bodily injuries where you are at fault, $5,000 in property damage liability where you are at fault, and $5,000 in coverage for your medical bills in an accident where you are at fault.

To make the task more realistic, the price for this product was fixed at approximately the current price paid by the respondent for auto insurance. Then respondents were offered the options shown in Table 1 and were told that they could either stay with the basic product or modify features. As new options within a particular feature are selected, the overall price changes to let the respondent know what the overall price was going to be. The costs associated with each feature option and the proportion of people choosing each option (as well as those who stayed with the basic package) are also shown on Table 1.

As seen on Table 1, between a third and a half of the respondents stay with the basic package on every feature and opt not to modify anything. The most frequent modification is the reduction of the comprehensive deductible to $250 (at a cost of $19), while the least attractive modification is the No increase in premium for up to 2 accidents in 3 years. The latter does carry a stiffer price tag ($56) that may make it unattractive.

While the information contained in this table is interesting and would provide auto insurance providers with good insight on what consumers want, the results could perhaps be more interesting if we could identify segments in the data. To this end, these data were segmented using cluster analysis. The resulting five-segment solution is shown in Table 2.

Segment 1, which is about a third of the sample, is clearly the most satisfied with the base product. Respondents in this segment show virtually no interest in the options offered on each feature. These respondents are also the most likely to say that their current premium is low (33% say it is less than $400, compared to 26% for the entire sample). It is possible that these are the price conscious shoppers and it also appears that they are not particularly wealthy.

Segments 2 and 3 (19% each, of the total sample) have strong preferences for low deductibles (both collision and comprehensive) and both segments like the idea of their premium increasing only if they are at fault in an accident. But there are some other areas where they sharply differ. Segment 2 is very concerned about bodily injury liability, while Segment 3 strongly prefers a one-year policy term. They are very clearly different with regard to

deductible reductions based on lack of accidents. Segment 2 strongly prefers the 1-year no accident option, while Segment 3 overwhelmingly prefers the 6-month no accident option. Finally, Segment 2 appears to be wealthier, somewhat younger and more educated.

Segment 4 clearly prefers high deductibles. It may be even more price conscious than Segment 1 since increasing the deductibles is the only way to reduce the price of the product below that of the base price. Respondents in this segment may also be more confident of not getting into accidents, given that they like the 1-year no accident option for decreasing deductibles. This segment seems to be more educated than other segments and is twice as likely to be Asian (4% compared to 2% for the next highest segment).

Segment 5 (13%) appears to be a middle-of-the-road segment on most features and tends to stay with the base product half the time.

Taken together these results show that the product configurator can effectively separate out the segments in this market based on preferences. This task is considerably easier to design and is very easy for the respondent to answer compared to a conjoint task. While simulations may not be straightforward, some very useful information can be obtained from the study. Further, explaining the results to senior management will be easier than in the case of a conjoint analysis.

Table 1

Feature and Options	Cost	% Chosen
Collision Deductible		
$250 Deductible	$74	33%
$1000 Deductible	-$37	24%
BASE ($500 Deductible)		43%
Bodily Injury Liability		
$300K, $300K	$58	38%
$100K, $300K	$52	28%
BASE (State Minimums)		34%
Get Out of Accident Free Feature		
Premium increase only if at fault	$25	33%
No increase for one fault in three years	$40	17%
No increase for two faults in three years	$56	7%
BASE (Increase possible in any accident)		43%
Extended Policy Term		
One year policy term	$50	34%
Two year policy term	$100	16%
BASE (Six month policy term)		50%
Decreasing Deductible		
6 months no accidents $50 less/max $250	$15	30%
1 year no accidents $100 less/max $500	$25	35%
BASE (No decrease in deductible)		35%
Comprehensive Deductible		
$250 Deductible	$19	42%
$1000 Deductible	-$13	20%
BASE ($500 deductible)		38%

Table 2

Feature and Options	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5
Segment Sizes	**32%**	**19%**	**19%**	**17%**	**13%**
Collision Deductible					
$250 Deductible	7%	**66%**	**78%**	0%	25%
$1000 Deductible	5%	8%	5%	**97%**	27%
BASE ($500 Deductible)	**88%**	26%	17%	3%	48%
Bodily Injury Liability					
$300K, $300K	20%	**95%**	33%	44%	0%
$100K, $300K	0%	0%	55%	32%	**99%**
BASE (State Minimums)	**80%**	5%	12%	24%	1%
Get Out of Accident Free Feature					
Premium increase only if at fault	19%	**40%**	**58%**	29%	27%
No increase for one fault in three years	5%	27%	30%	18%	11%
No increase for two faults in three years	1%	23%	3%	12%	4%
BASE (Increase possible in any accident)	**75%**	10%	9%	41%	**58%**
Extended Policy Term					
One year policy term	7%	37%	**74%**	43%	20%
Two year policy term	3%	40%	11%	19%	21%
BASE (Six month policy term)	**90%**	23%	15%	38%	**59%**
Decreasing Deductible					
6 months no accidents $50 less/max $250	17%	1%	**89%**	24%	21%
1 year no accidents $100 less/max $500	14%	**87%**	6%	47%	45%
BASE (No decrease in deductible)	**69%**	12%	5%	29%	34%
Comprehensive Deductible					
$250 Deductible	14%	**84%**	**85%**	0%	39%
$1000 Deductible	2%	2%	9%	**98%**	5%
BASE ($500 deductible)	**84%**	14%	6%	2%	**56%**