



# Using Discrete Choice Analysis to Succeed at New Product Development: How NOT to Design an Edsel!

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## Background

In 1957, Ford introduced a revolutionary new car, the Edsel. The development of the Edsel began in 1955 with one of the most extensive R&D efforts in the history of auto making at that time. This included far-reaching market research to determine the most preferred features and functions to include in the car. Edsel offered several innovative features, among which were a “rolling dome” speedometer, warning lights, Push-button Teletouch transmission shifting system in the center of the steering wheel, ergonomically designed controls for the driver, and self-adjusting brakes.

Despite all of Ford’s research, innovation and promotional efforts, the Edsel was a dismal failure; so much so that even today, *the name Edsel synonymous with failure*. So, what happened?

Among other things, one reason for Edsel’s flop was the inappropriate use of market research. Consumers were asked to choose their favorite body shape, grill, fenders, wheels, interior features, engine, and colors, all individually, and not with the whole product in mind. Ford then took the “winning” feature in each category, and put them together to produce the Edsel. This resulted in a final product that some have called the duckbilled platypus of the automotive world.

Unfortunately, consumers do not purchase individual features; they purchase the entire of bundle of features making up the product (or service.) Optimizing individual features may not - obviously, in the case of the Edsel - optimize the whole product.

## Discrete Choice Analysis (DCA)

This situation could have been avoided by using Discrete Choice Analysis (DCA). DCA is an analytical technique used to simulate real-world consumer purchasing behavior. Through an experimental design, consumers are simply provided with a series of product choices, consisting of a bundle of features, varying by particular attributes and levels. For each product choice, consumers are asked to choose the one bundle of attributes that they would most likely buy or, if they don’t like any of them, to select none of the choices. The decision that the respondent makes is designed to mimic real-world purchasing behavior, without the respondent being consciously aware that they are also evaluating the relative importance of each product attribute.

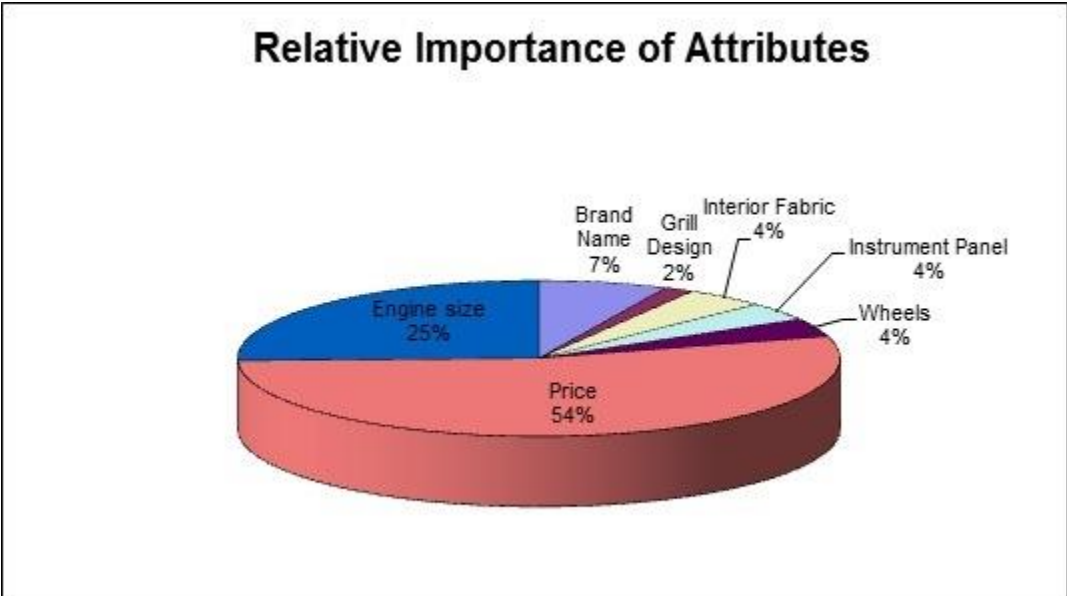
For example, if Infosurv were going to attempt to design a new “Edsel”, we may want to include a number of attributes in the test including; Brand Name, Engine Size, Grill Design, Interior Fabric, Instrument Panel, Wheels, and Price. Each attribute is then described as a number of levels. For instance, levels for engine size may be 2.0L, 3.0L, or 3.5L. Interior Fabric might be leather, cloth, or (today) vinyl. A sample choice set is shown below:

Which of these cars are you most likely to buy?				
Brand Name	Edsel	Comet	Edsel	None of These
Engine Size	3.5L	2.0L	3.5L	
Grill Design	Chrome Lattice	Standard	Horse Collar	
Interior Fabric	Leather	Cloth	Leather	
Instrument Panel	Digital	Digital	Analog	

<b>Wheels</b>	17" aluminum	18" chrome	17" aluminum	
<b>Price</b>	\$2,990	\$1,990	\$2,990	
<b>Choose One</b>	✓	✓	✓	✓

**Using the Results for New Product Development**

DCA provides three main outputs that marketers can use in the product development process. First, by looking at the individual utilities or preferences of each of the product attributes, you can determine which attribute has the greatest impact on consumer choice and the relative impact of that attribute. In our example, the car's price accounts for 54% of the consumer choice, followed by engine size.



Second, within each attribute, you can see the relative preference of each attribute level. In the example below, a product with a price of \$1,990 is preferred 1.5 times more than one with a price of \$2,990.



Finally, we provide an Excel-based simulator that can show the forecasted share of market for any combination of attributes and levels to determine the optimal combination of attributes for a potential product. We will demonstrate how the simulator can be applied in Part 2 of this blog post.

If used, would Discrete Choice Analysis guided Ford to a better result with the Edsel? I guess we'll never know for sure. But, Infosurv can certainly provide clear, actionable, and timely information for

## How A Discrete Choice Simulator Can Be Used To Launch the Right Product

The final component of the [Discrete Choice Analysis \(DCA\)](#) technique is the provision of an Excel-based simulator to demonstrate the impact of different combinations of features and attributes on the forecasted share of market for a new product.

So, how would that work?

Let's take a different, more current example to illustrate the use of a simulator. Let's say that the CPG Corporation was interested in developing a new pet food. Their discrete choice design might have the following five attributes with corresponding variations:

ATTRIBUTES	NAME	AD CLAIM	ADDITIVES	PRICE	PROMOTION
<b>VARIATIONS</b>		Tastes Great			None
	Pet Yum	Supports Development	None	\$18.99	Free Sample
	Yum Yum	Supports Immune System	Vegetables	\$24.99	\$3 coupon
	Luv My Pet	Easy to Digest	Vegetables and Herbs	\$26.99	\$5 coupon
	Good Fud	Supports Growth		\$29.99	Buy one get one free
		Natural Ingredients			

In our hypothetical example, we can test consumer preferences of a pet food with different combinations of these attributes against existing pet foods in the marketplace. The most basic simulator would provide the raw choice shares, i.e. the percentage of people who prefer each combination of attributes. It would look something like this:

<b>Simulator CPG CORP</b>				
<b>Pet Food Attributes</b>		<b>Choice Probabilities</b>		<b>Total Sample</b>
On Shelf	<input type="checkbox"/> Yes	CPG	\$23.99	0.0%
Name	Pet Yum ▼	Eukanuba	\$23.99	14.2%
Ad Claims	Tastes Great ▼	Kibbles & Bits	\$25.99	25.9%
Additives	with Vegetables ▼	Purina	\$27.99	37.1%
Price	◀ ▶ \$23.99	Store Brand	\$13.99	7.2%
Promotion	None ▼	Pedigree	\$12.99	10.3%
Reset to Base Scenario		Iams	\$29.99	5.2%
		None		0.1%
		Sample Size		632

The box on the left allows you to manipulate the variables in the new product using drop down boxes for the variables and a continuous slider scale for pricing. The box on the right shows the results in terms of choice probabilities for the new product and each of the current competitors. In this Base Scenario, the CPG product has not been launched and therefore has a zero choice probability. Purina has the highest share of the market (37.1%) under this scenario.

So, let's see what would happen if you launched the CPG product (by checking "yes" to On Shelf), with the following characteristics:

<b>Name</b>	<b>Pet Yum</b>
<b>Ad Claim</b>	<b>Tastes Great</b>
<b>Additives</b>	<b>Vegetables</b>
<b>Price</b>	<b>\$19.97</b>
<b>Promotion</b>	<b>None</b>

## Simulator CPG CORP

Pet Food Attributes		Choice Probabilities	Total Sample	North East	South	Mid West	South West	Mountain	West	
On Shelf	<input checked="" type="checkbox"/> Yes	CPG	\$19.97	11.6%	7.6%	9.6%	8.8%	16.6%	10.0%	13.9%
Name	Pet Yum	Eukanuba	\$23.99	12.8%	14.6%	14.8%	15.7%	16.8%	13.8%	9.0%
Ad Claims	Tastes Great	Kibbles & Bits	\$25.99	23.8%	30.3%	25.1%	23.0%	25.6%	21.1%	21.2%
Additives	with Vegetables	Purina	\$27.99	32.6%	35.3%	34.8%	34.7%	26.8%	34.6%	31.7%
Price	\$19.97	Store Brand	\$13.99	5.8%	2.7%	5.9%	6.7%	7.6%	6.5%	4.0%
Promotion	\$5-Off Coupon	Pedigree	\$12.99	8.5%	8.9%	5.9%	7.9%	7.5%	8.9%	11.5%
		lams	\$29.99	4.7%	0.3%	3.8%	3.1%	5.0%	4.9%	8.6%
		None		0.1%	0.3%	0.1%	0.2%	0.1%	0.1%	0.1%
		Sample Size		632	60	98	99	128	126	121

Reset to Base Scenario

Reset to Base Scenario

None	0.1%
Sample Size	632

The new CPG Pet Yum product gains a 3.6% share of the market with these characteristics and the current brands lose some share.

If we add a \$5 off coupon, the CPG Pet Yum product gains 8 share points!

## Simulator CPG CORP

Pet Food Attributes		Choice Probabilities	Total Sample
On Shelf	<input checked="" type="checkbox"/> Yes	CPG	\$19.97
Name	Pet Yum	Eukanuba	\$23.99
Ad Claims	Tastes Great	Kibbles & Bits	\$25.99
Additives	with Vegetables	Purina	\$27.99
Price	\$19.97	Store Brand	\$13.99
Promotion	\$5-Off Coupon	Pedigree	\$12.99
		lams	\$29.99
		None	
		Sample Size	

Reset to Base Scenario

Now, what if CPG Corp wanted to see how the product would do by various regions in the country. You could add a layer of segmentation to the simulator that would look something like this:

As you can see, the product would be most successful in the Southwest.

Finally, we could play out the scenarios by varying product distribution assumptions for the CPG product and for the competitors by adding a sliding weighting scale like the one below titled Brand Distribution. If we assume that the new CPG Pet Yum will only get 50% store distribution, versus the distribution shown for the other brands, the new product will receive a 7.0% share overall, and an 11.9% share in the Southwest.

<b>Simulator CPG</b>										
<b>Beech-Nut Attributes</b>		<b>Choice Probabilities</b>	<b>Total Sample</b>	<b>North East</b>	<b>South</b>	<b>Mid West</b>	<b>South West</b>	<b>Mountain</b>	<b>West</b>	
Sub-Brand Name	Pet Yum	CPG	\$19.97	7.0%	4.0%	5.6%	5.1%	11.9%	4.8%	8.7%
Claims	Tastes Great	Eukanuba	\$23.99	13.8%	14.5%	15.0%	16.2%	12.0%	14.7%	10.1%
Additives	With Vegetables	Kibbles & Bits	\$23.99	22.6%	26.7%	24.1%	21.7%	23.3%	18.8%	20.3%
Price	\$19.97	Purina	\$23.99	40.1%	42.8%	41.9%	40.6%	35.0%	43.8%	38.4%
Promotion	\$5-Off Coupon	Store Brand	\$13.99	3.4%	0.7%	3.0%	3.9%	4.9%	4.6%	2.0%
Reset to Base Scenario		Pedigree	\$12.99	9.7%	10.9%	7.3%	9.2%	8.7%	10.0%	13.4%
		Iams	\$29.99	3.3%	0.1%	2.9%	3.0%	3.9%	3.2%	6.9%
		None		0.3%	0.3%	0.2%	0.4%	0.2%	0.2%	0.2%
		Sample Size		632	60	98	99	128	126	121
<b>Brand Distribution</b>										
CPG	50%									
Eukanuba	85%									
Kibbles & Bits	75%									
Purina	100%									
Store Brand	45%									
Pedigree	80%									
Iams	60%									
None	100%									

The Discrete Choice Simulator provides a relatively simple interface for often complex consumer choice modeling problems and the flexibility to account for real world variation. However, the true power in the Simulator is its ability to test an endless array of scenarios for a new product to identify the most effective marketing strategies and tactics.

To sum up, Discrete Choice can be a powerful tool to support the development and assessment of new product concepts and increase the probability of success in the marketplace. The technique provides marketers and product developers with three important pieces of information:

- The product attributes that would have the greatest positive impact on consumer choice
- The relative preference of each variation within an attribute
- The impact of various combinations of product attributes on market probabilities within a competitive context

If you want to learn more about Infosurv’s approach to applying Discrete Choice Modeling, contact us at 888.262.3186 or [sales@infosurv.com](mailto:sales@infosurv.com).