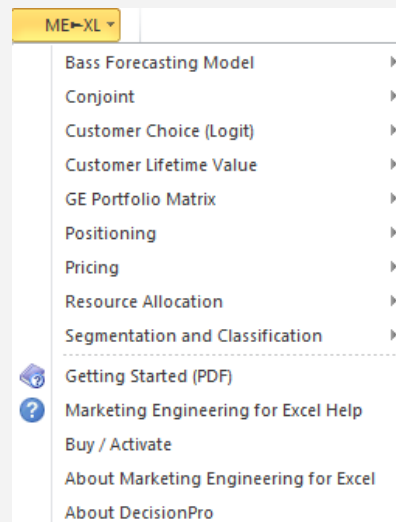Tutorial
Positioning

Marketing Engineering for Excel is a *Microsoft Excel* add-in. The software runs from within Microsoft Excel and only with data contained in an Excel spreadsheet.

After installing the software, simply open *Microsoft Excel*. A new menu appears, called "*ME▸XL.*" This tutorial refers to the "*ME▸XL/Positioning*" submenu.

ME►XL ▾	
Bass Forecasting Model	▶
Conjoint	▶
Customer Choice (Logit)	▶
Customer Lifetime Value	▶
GE Portfolio Matrix	▶
Positioning	▶
Pricing	▶
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Segmentation and Classification	▶
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Overview

Positioning analysis software incorporates several mapping techniques that enable firms to develop differentiation and positioning strategies for their products. By using this tool, managers can visualize the competitive structure of their markets, as perceived by their customers. Typically, data for mapping include customer perceptions of existing products (and new concepts) along various attributes, customer preferences for products, and measures of the behavioral responses of customers toward the products (e.g., current market shares).

Positioning analysis uses perceptual mapping and preference mapping techniques. Perceptual mapping helps firms understand how customers view their product(s) relative to competitive products. The preference map plots preference vectors or ideal points for each respondent on a perceptual map. The ideal point represents the location of the (hypothetical) product that most appeals to a specific respondent. The preference vector indicates the direction in which a respondent's preference increases. In other words, a respondent's ideal product lies as far up the preference vector as possible.

Positioning analysis also helps firms answer such questions as:

- ✓ How should we position our new product with respect to existing products in the market?
- ✓ According to customer perceptions, which target segments are the most attractive for our brand?
- ✓ How do our customers view our brand, relative to other brands?
- ✓ Which brand is most closely associated with the attributes that our target segment perceives as desirable?
- ✓ Which brands do our target segments consider to be our closest competitors?
- ✓ What product category attributes are most responsible for the perceived differences among brands?
- ✓ How would changes in a brand's perceived attributes alter its market share?

Getting Started

To apply positioning analysis, you can use your own data directly or a preformatted template. Under both options, the first row contains column headings for the stimuli (brands), and the first column contains attribute labels and/or identifiers denoting each customer's preferences.

> The next chapter explains how to create an easy-to-use template to enter your own data.
>
> If you want to run a positioning analysis immediately, open the example file "*OfficeStar Data (Positioning).xls*" and jump to "Step 3: Running analysis" (p. 3). By default, the example files are installed in "*My Documents/My Marketing Engineering/.*"

Step 1   Creating a template

In Excel, if you click on ME ▸ XL → POSITIONING → CREATE TEMPLATE, a dialog box appears. This dialog box allows you to create a template to run the positioning analysis software. All positioning maps require at least two brands. For perceptual maps, you must have at least two attributes. For preference maps, you need at least two respondents. In addition, to estimate market shares, you must have access to preference data.

Options for Positioning Analysis

The first option refers to the **number of columns** contained in the data set. Enter as many columns as there are **brands** (or **stimuli**) to be compared.

A positioning analysis can be based on perceptual data, preference data, or both at the same time.

- **Perceptual data** describe the market space occupied by various products or offerings, as perceived by customers in the target segment(s). These data do not necessarily describe the attributes of a product/offering; rather, they refer to customer perceptions of the products/offerings along those selected attributes. For example, they indicate how the target market perceives Volvo on the "Safety" dimension (but not actual safety ratings of Volvo cars).

- **Preference data** summarize customer preferences for the various products/offerings, and therefore, clarify whether a customer prefers Offering A or Offering B. Preferences may translate into purchases of the preferred offerings if no constraints (e.g., budget) prevent customers from expressing their preferences through purchase. If preference data are not available, in some cases, you may substitute past purchase or market share data to represent customer or segment preferences.

Perceptual data

Enter the number of **attributes** (rows) along which the brands will be compared (e.g., price, quality, design, safety, power, service quality). This option is enabled only with perceptual data.

Preference data

Enter the number of **respondents** (customers) who are included in the data. This option is enabled only when you choose to include preference data in the study.

Checking the "**Include individual respondents' matrices**" box creates individual data matrices below the main perceptual and preference matrices. You can change the perceptual matrix column and row titles throughout the sheet, then enter individual respondents' information (name/identifier and each person's perceptual or preference data) in the matrices.

The perceptual and preference matrices needed for the analysis are automatically calculated on the basis of the data available in the individual matrices, namely:

- **Perceptual matrix,** which depend on the averages of respondents' ratings.

- **Preference matrix,** which get copied individually into a unique matrix that employs the appropriate format.

Checking the "**Include Segment Column**" check box creates a separate column that is appended to the Preference Data table. If used and populated, Positioning will display Segment vectors on the perceptual map. Note: Positioning does not provide the functionality to determine the needed segments. Segment assignments should be made using the Segmentation model, and those Segment Membership results should then be copied under the segment column.

Perceptual Data

Average score each brand achieves on each attribute from your sample of respondents.

Attributes / Brands	Enter brand 1 here	Enter brand 2 here	Enter brand 3 here	Enter brand 4 here
Enter attribute 1 here	0	0	0	0
Enter attribute 2 here	0	0	0	0
Enter attribute 3 here	0	0	0	0
Enter attribute 4 here	0	0	0	0
Enter attribute 5 here	0	0	0	0

Preference Data

Preference score data obtained for each brand from each respondent.

Respondents / Brands	Enter brand 1 here	Enter brand 2 here	Enter brand 3 here	Enter brand 4 here	Segment
Respondent 1					
Respondent 2					
Respondent 3					
Respondent 4					
Respondent 5					
Respondent 6					
Respondent 7					
Respondent 8					
Respondent 9					

Record attribute scores for each brand in the matrices below, using one matrix per respondent.

Respondent 1				
Attributes / Brands	Enter brand 1	Enter brand 2	Enter brand 3	Enter brand 4
Enter attribute 1 here	0	0	0	0
Enter attribute 2 here	0	0	0	0
Enter attribute 3 here	0	0	0	0
Enter attribute 4 here	0	0	0	0
Enter attribute 5 here	0	0	0	0
Preference Score				

Step 2   Entering your data

F.Y.I.

In this tutorial, we use the example file "*OfficeStar Data (Positioning).xls,*" which in the default condition appears in "*My Documents/My Marketing Engineering/.*"

To view a proper data format, open that spreadsheet in Excel. A snapshot is reproduced below.

Perceptual Data

Average score each brand achieves on each attribute from your sample of respondents.

Attributes / Brands	OfficeStar	Paper & Co	Office Equipment	Supermarket
Large choice	5.2	4.4	3.9	2.3
Low prices	2.1	4.5	2.6	4.1
Service quality	4.2	2.3	3.1	1.8
Product quality	3.7	2.6	3.1	2.9
Convenience	2.7	1.4	4.7	5.1

Preference Data

Preference score data obtained for each brand from each respondent.

Respondents / Brands	OfficeStar	Paper & Co	Office Equipment	Supermarket	Segments
John	5	3	3	1	1
Mike	4	3	4	2	1
Lori	4	2	3	2	1
Mary	5	3	5	3	1
Radjeep	2	5	3	2	2
Antoine	4	3	2	2	1
Yoshi	3	3	4	2	2
Hubert	1	2	3	5	3
Michael	2	4	4	3	2
Elisabeth	2	5	4	3	2

Individual Respondents' Data

Record attribute scores for each brand in the matrices below, using one matrix per responde

John

Attributes / Brands	OfficeStar	Paper & Co	Office Equipment	Supermarket
Large choice	5	4	5	2
Low prices	3	4	4	5
Service quality	3	2	5	3
Product quality	2	3	2	2
Convenience	1	1	2	4
Preference Score	5	3	3	1

Mike

Attributes / Brands	OfficeStar	Paper & Co	Office Equipment	Supermarket
Large choice	3	5	3	2
Low prices	1	4	2	6
Service quality	3	1	1	1
Product quality	4	2	3	5
Convenience	4	1	4	6
Preference Score	4	3	4	2

Lori

Attributes / Brands	OfficeStar	Paper & Co	Office Equipment	Supermarket
Large choice	6	4	3	3

A positioning analysis spreadsheet contains:

- **Perceptual data,** or the averages of respondents' ratings.

- **Preference data,** which are specific to each respondent (in the example, 10 respondents expressed their preferences for all 4 options).

Note that if available (as in the OfficeStar example), the software automatically calculates perceptual and preference matrices on the basis of the data available in the individual data matrices. You just need to enter individual data in the matrices below the main ones, and the main matrices will then be automatically updated.

Step 3 Running analyses

After entering your data in the Excel spreadsheet using the appropriate format, click on ME▸XL → POSITIONING → RUN ANALYSIS. The dialog box that appears allows you to set the options to perform a positioning analysis of your data.

Options

First, select the number of dimensions you want to retain for the positioning map.

Positioning analysis can produce either two- or three-dimensional maps. If you select the 3-D map option (but without checking the Interactive map option) the maps will be displayed two dimensions at a time. When you view the final results of the mapping analysis in Excel, for the 2-D analysis, the software will only display a two-dimensional view showing the first two axes, X and Y. The

three-dimensional map is represented in three charts that show pairwise representations of the three axes, namely (X,Y), (X,Z), and (Y,Z).
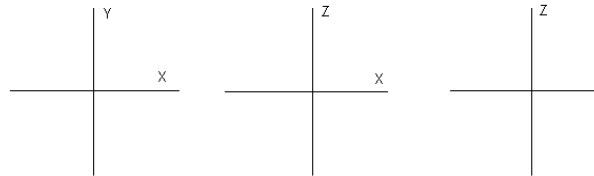
If you select the Interactive, a 3-D interactive map will be displayed allowing you to see more clearly how the brands and attributes are positioned in the space. The interactive map also allows you rotate the map in three dimensions, and to modify the positioning of brands and change the values of attributes to assist in your analysis. For a more comprehensive explanation of the Interactive 3-D map, please refer to the Appendix **Using the Interactive Maps.**

> When you click the Interactive check box, the Number of Dimensions will automatically be changed to 3-D. You may change the number of dimensions back to 2-D by simply selecting the 2-D radio button. Some interactive features are disabled when in 2-D, so most users will find 3-D more useful.

When you use the market share function of positioning analysis with the non-interactive 3-D map, any changes that you make to the position of a brand on any one of the three views, will change the position of the brand in **one** of the two other views.

Depending on the type of data available, you can select one of three types of maps to generate:

- **Perceptual map:** Using perceptual data only, this map depicts a data matrix that consists of the average perceptions of different brands (offerings) in a target segment. The resulting map provides a visual representation, in two or three dimensions, of how the target segment perceives all the offerings.

- **Preference map:** This option is appropriate if you only have preference data (i.e., you lack information about how the target segment perceives the different offerings along various attributes but have data about the extent to which customers' like or dislike various brands).

- **Joint space map:** Because it includes both perceptual data and preference data on the same map, this option offers the most insights by incorporating both perceptions and preferences. Joint space maps allow you to assess the relative attractiveness (in terms of potential market share) of repositioning your brand in different areas of the map and offer insights into which attributes of your brand you should change to make it occupy a different position on the map.

Preference model

Positioning analysis software can represent respondents' preferences using different conceptual models. The underlying preference model then simulates market shares in subsequent analyses.
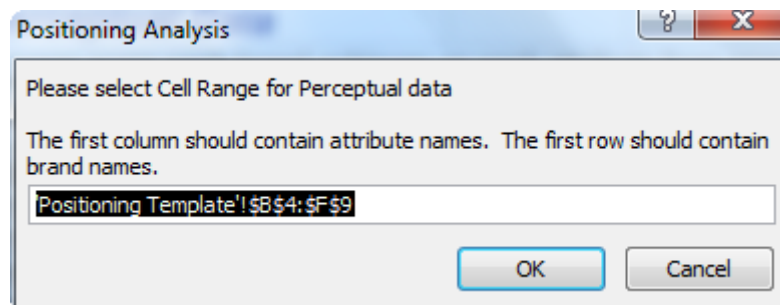
- **Ideal point models** denote each respondent's preferences by an "ideal point" on the map. The closer an offering is positioned to a respondent's

ideal point, the more preferred that offering is compared with an offering positioned farther away. This option is available when you have access to preference data.
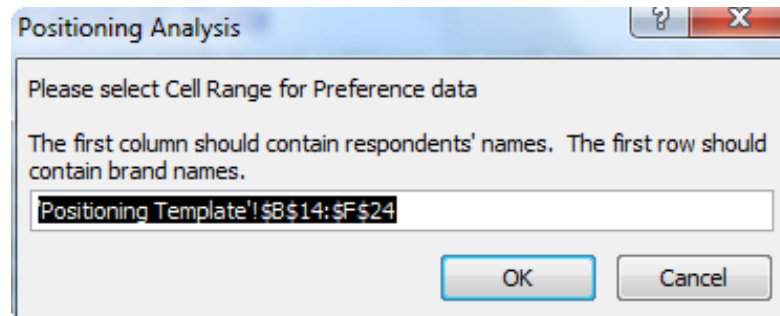
▪ **Vector preference models** denote each respondent's preferences with a vector that represents the direction in which that respondent's preferences increase. This option is available only if you have access to both preference data and perceptual data; otherwise, it will be disabled.

In the case of 3-D interactive maps, if you have data indicating the segment to which each respondent belongs, you can check the box "Use Segmentation Data."

After you have selected all the options, you must select the cells containing the data.

The Segmentation selection dialog box will only appear if you have selected the Use Segmentation Data in the analysis setup dialog.
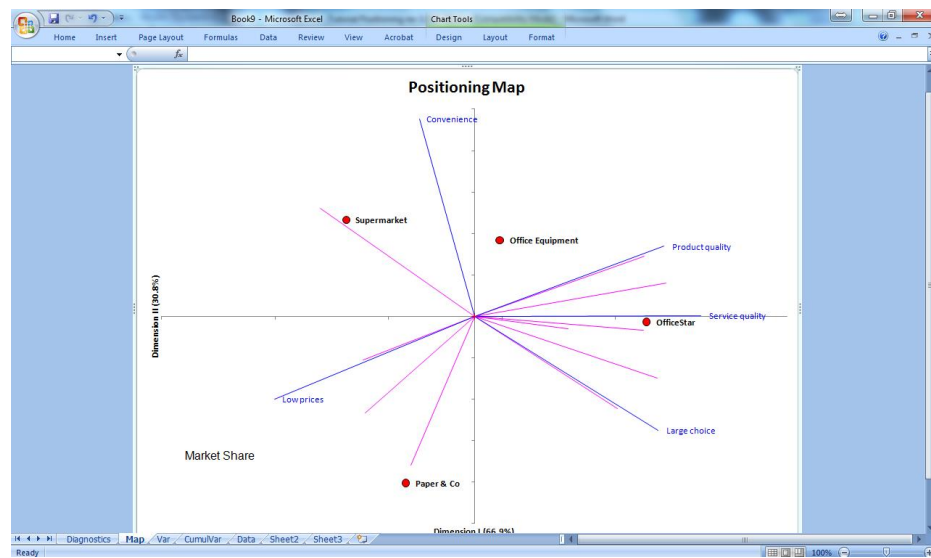

The software then generates a new spreadsheet that contains the results of your positioning analysis.

Step 4   Interpreting the results

Positioning map(s)

The generated positioning map(s) will consist of:

- **One map** if you choose to retain two dimensions (X-Y).

- **Three maps** if you choose to retain three dimensions (X-Y, X-Z, and Y-Z).


When interpreting the maps, keep in mind:

- The distances between products on the map indicate their perceived similarities. Products that are close together are perceived as similar, whereas those that are far apart are perceived as different.

- The axes of a perceptual map are the aggregate dimensions (or composite attributes) along which customers tend to discriminate offerings. Attributes aligned close to each axis provide clues of the meaning of that axis. The variance explained by each axis indicates the relative importance of that axis for explaining customer perceptions. If the variance explained by the horizontal dimension is 40% and the variance explained by the vertical dimension is 20%, the horizontal dimension is twice as important in explaining customer perceptions.

- The lines on a perceptual map indicate the direction in which an attribute increases while moving away from the origin along that line. For example, if the "Service quality" attribute uses a 1–9 scale, in which 9 represents the highest quality, then service quality increases along that line and away from the origin.

- The length of a line on the map indicates the variance in that attribute explained by the perceptual map. The longer a line, the greater is the importance of that attribute in differentiating among offerings in the market.

- To position a product on any attribute on the map, you can draw an imaginary perpendicular line from the product to the attribute. The farther an offering is from the origin along the direction of that attribute, the higher is the rating of the offering on that attribute.

- Note that if an attribute (e.g., screen display) uses a reverse scale measure (e.g., higher numbers represent poorer screen display), the offerings have progressively poorer screen displays as they move along the related attribute vector, away from the origin.

- The red lines on a joint space map with a vector preference model indicate the preference vectors of the respondents (customers). Preference increases in the direction of the line away from the origin. The length of the line indicates the variance in that customer's preferences explained by the map. The longer the line, the better the map captures the preferences of the customer.

- The purple dots on a joint space map with an ideal point preference model indicate the locations of the "ideal" offering (i.e., brand) for that customer. The farther an offering is from the ideal point, the less the customer prefers that offering. The "Diagnostics" sheet summarizes the variance of each customer's preferences explained by the joint space map.

If you do not have perceptual data, you can still draw a perceptual map using the **Ideal point model**, which requires preference data only. In an ideal point perceptual map, each brand and customer is represented by a point, one customer prefers the brands that are the closest to him. Two brands close to one another in the map indicates that these brands are liked (or disliked) by the same customers, hence are competing for the same segments of customers. This type of map contains less information, but is useful in the absence of perceptual data.
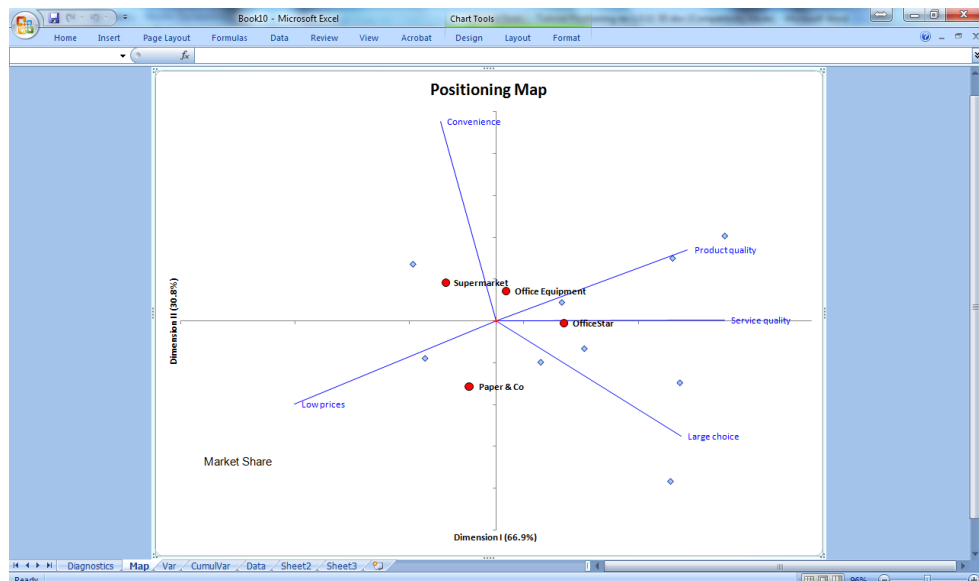
Diagnostics (tab)

The Diagnostic tab contains useful information for understanding and interpreting the results further.

- **Variance explained** (and cumulated variance explained) refers to how much variance in the data the maps capture (summarize). The difference in the variance explained by two versus three dimensions should guide your decision regarding whether it is worth the added effort and complexity to run a three-dimensional analysis.

- **Statistics** give general statistics about the dimensions.

- **Coordinates** indicate the exact coordinates of each item and dimension in the new reduced space.

- **Diagnostics for preference map** indicate the extent to which the new reduced map effectively captures or explains the variability of preferences.

Variance explained and cumulated variance explained (charts)

The Variance Explained and Cumulated Variance Explained charts plot how much each additional factor retained in the new reduced space captures variance in the original data.
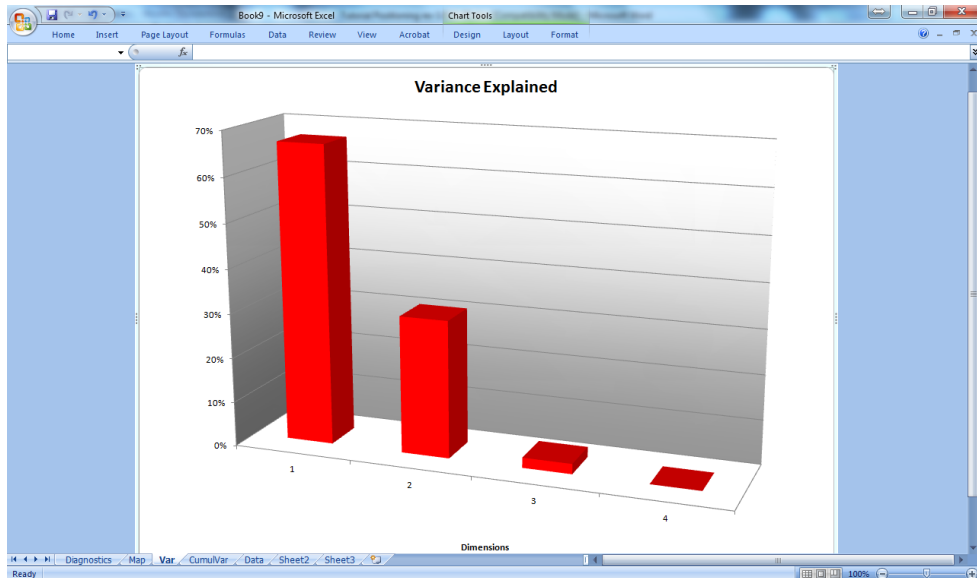
When deciding whether to retain two or three dimensions, you should choose three dimensions only if the third factor captures significantly more variance (compared with the first two). In the OfficeStar example, the first two factors capture 97.7% of the variance in the initial data, and adding a third factor captures only an additional 2.3%. Therefore, adding a third factor to this analysis is not worth the extra effort, and the analyst should retain just the first two.
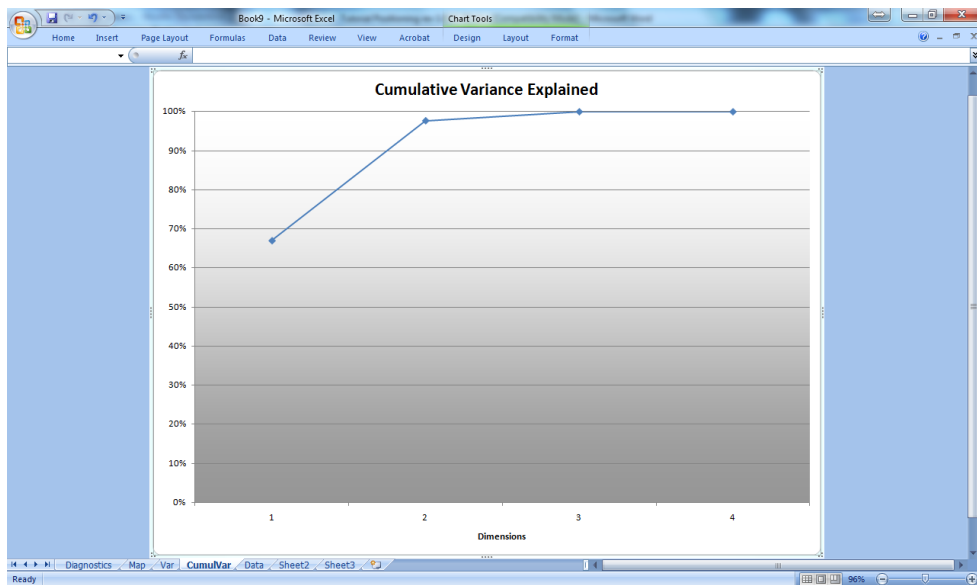
Step 5   Market share analysis

When consumers' preference data are available, you have additional options that are not available with simple perceptual maps—namely, running market share analysis, which allows you to estimate the market shares of existing products if they were moved around in the map.

The Appendix details how you can determine market shares when you use the Interactive Map. In this section, we describe you would compute market shares with the static (non-interactive) map that is displayed within Excel.

To select a product whose market share you want to explore at various locations on the map, press SHIFT + LEFT CLICK on the diamond next to the desired product (the product icon will turn red). To explore its potential market share, simply press SHIFT + LEFT CLICK anywhere on the chart to display its market share at that point. Cross-hairs will appear at that position on the map, along with a market share figure (bottom left of the screen), as shown below. You should interpret the computed market share as a measure of the relative attractiveness (i.e., relative to market share at the original position) of the selected location on the map for the selected product rather than an indicator of the absolute magnitude of the market share the product can realize at the new position.
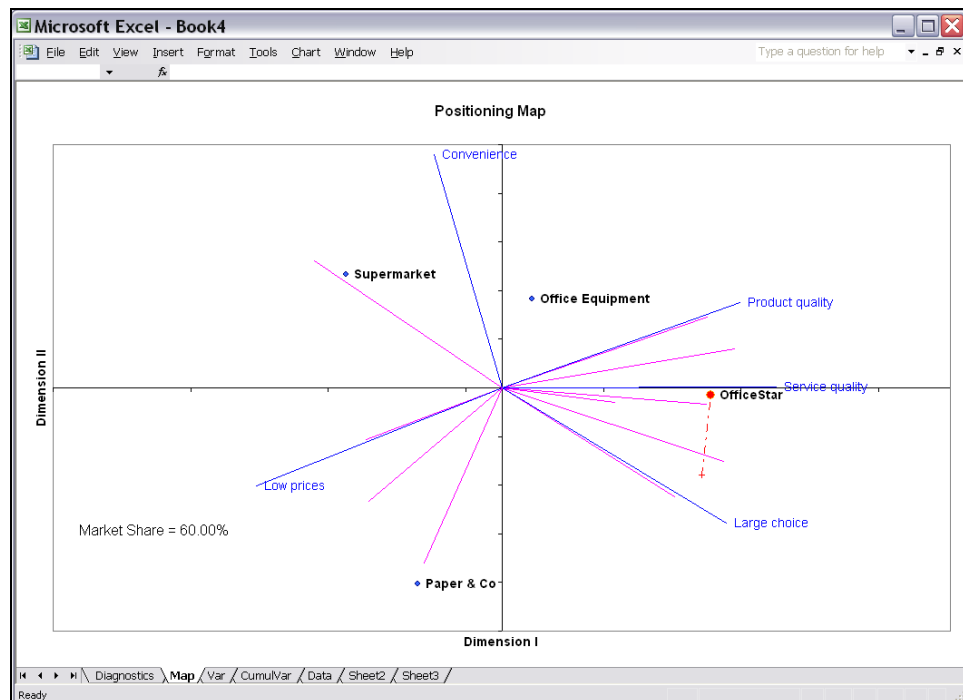
In computing market share, the software assumes that the selected product has been relocated to the new position indicated by the cross-hairs (the map still shows the product at its original location for comparison purposes) but all other products remain at their original positions.

You can display other chart options by pressing SHIFT + CTRL + LEFT CLICK.
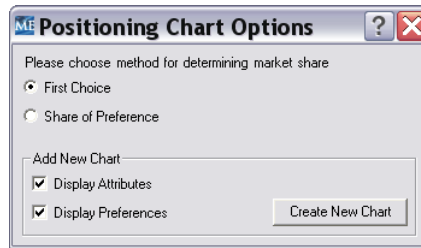
The radio buttons (circles) allow you to select the choice rule to use for the market share computations.

- The **first-choice rule** assumes that each customer purchases only his or her most preferred product.

- The **share-of-preference rule** assumes that the probability a customer will select a product is proportional to the product's share of preference with respect to all products included in the model. (The share-of-preference model, as implemented here, arbitrarily sets the preference value of a customer's least preferred product to 0.)

The check boxes allow you to create a new copy of the positioning map that includes either attributes or preferences. If you select neither check box, the Create New Chart action produces a chart showing only the brands.

Appendix   Using the Interactive Maps

> Positioning Interactive Maps is an advanced feature which will allow the user to see the perceptual map in an interactive mode. Users can customize the display using the controls outlined below, and can reposition products (or add a new one) and explore each attribute and how it contributes to the market position held by that product.

If you have selected the option to show the Interactive map, a map will be generated similar to the one below.

Note: While the interactive map is open/active, you will not be able to utilize other functions in Excel.
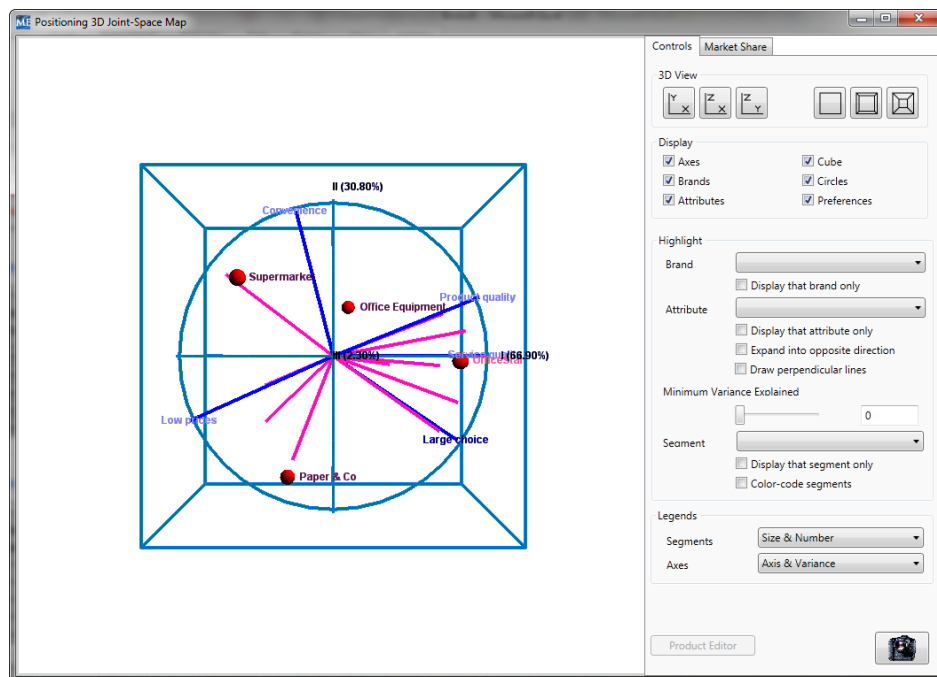
Please refer to the annotated diagrams below and the following descriptions for each function of the Interactive map.
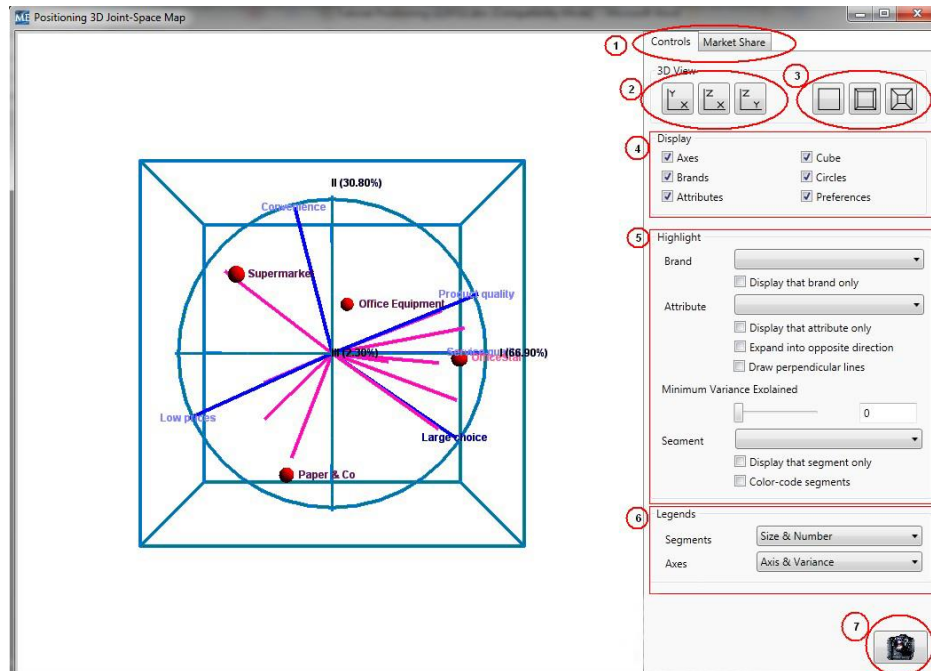
1. Tabs
The display will open to the Controls tab, allowing you to manipulate the display as well as selecting other options described below. Clicking on the Market Share tab will enable you to do analyses to reposition a brand in the map to see how the market share changes for the selected brand at various positions on the map.

2. Display Plane
Clicking any of the 3 images shown in this section will change the 3D display to view the chosen 2 axes. Note: Holding down the left mouse button and moving the mouse in the chart area will rotate the map to any position you desire.

3. Display Boundary
Clicking any of the images shown in this section will change the perspective from orthographic projection to one of two levels of perspective projection.

4. Display Elements
The check boxes in this section cause the selected item to be displayed or omitted.

5. Highlight
This section allow you to customize your map to display, hide, or highlight brands, attributes and segments. This feature, combined with the camera snapshot feature, is particularly useful in comparing positioning and analysis alternatives.

You may also modify the Variance level displayed on the chart which is useful in suppressing vectors which do not significantly contribute to the result.
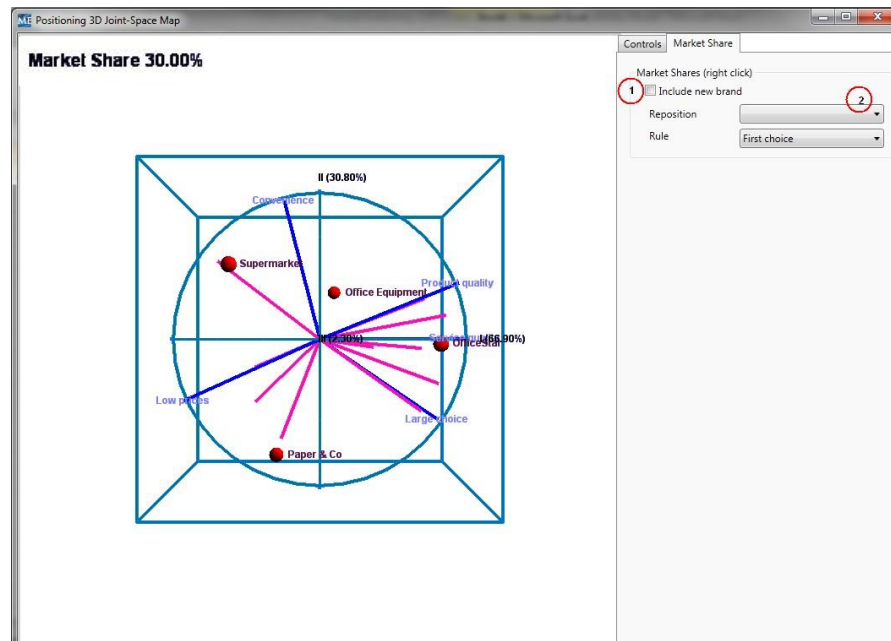
6. Legends
The section allows you to modify the display of legends that are shown for Segments and Axes.

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7. Snapshot
The snapshot icon will record an image of the map as it is currently displayed.

MarketShare

Clicking on Market Share tab will display the charts below. See the section below for a description of the controls on this chart.

1. Include new brand
If you check the "include new brand" check box, then left click somewhere on the chart, and the new brand will be displayed at the position of the click. The Market Share garnered by the new brand is displayed in the top left corner of the map.

2. Reposition
If you want to reposition an existing brand in the map, select it by using the list of brands displayed in the drop down box. Then, left click somewhere on the map to reposition that brand. The Market Share for the existing brand in the new position will be displayed in the top left corner of the map.

Note: The repositioning of a brand may not be placed exactly where you click on the map. The new position will be as close as possible to where you clicked, but is constrained by the attribute data present in the analysis, including the "Exceed Original Inputs" value described below.

3. Rule
You have two different options for computing market shares, namely, first-choice rule and share-of-preference rule.

- The **first-choice rule** assumes that each customer purchases only his or her most preferred product.

- The **share-of-preference rule** assumes that the probability a customer will select a product is proportional to the product's share of preference with respect to all products included in the model. (The share-of-preference model, as implemented here, arbitrarily sets the preference value of a customer's least preferred product to 0.)

Clicking on Sliders tab will display the charts below. If you have repositioned a brand on the chart, the sliders will display the values for each attribute that determines the new position held by the brand.

Manipulating the sliders will change the new position held by the brand. This dynamic repositioning is useful for understanding how each attribute contributes to the computed market share.

You may also adjust the ranges controlled by the sliders (at the bottom of the chart below). By using this control you can allow the attribute sliders to exceed the data ranges in the raw input data. If you wish to restrict new brand placements in the map to the attribute value ranges of the original data, then push the slider to the left.
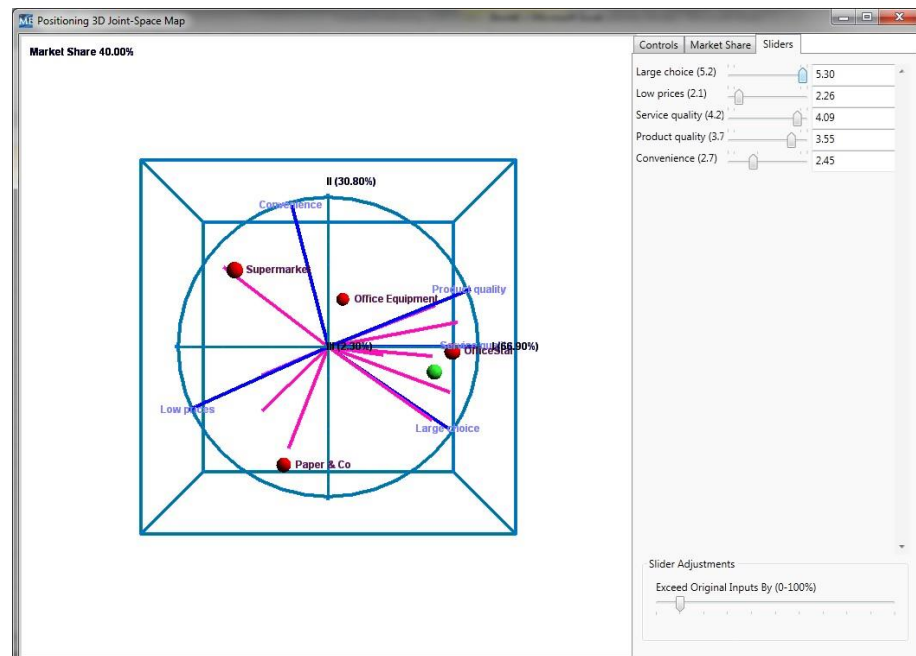
After completing your work with the interactive display, simply close the image by using the "X" in the upper right corner of the map. Marketing Engineering for Excel will continue by drawing the Excel version of the 3D map.