

Interactive  
Knowledge  
Automation  
Selection  
Systems  
For The  
Web

**Exsys**  
**RuleBook<sup>®</sup>**  
SELECTOR

**TUTORIAL**



EXSYS RULEBOOKS - MAKING WEB SITES SMART

Exsys® RuleBook® Selector Tutorial

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## Introduction

### RuleBooks

Welcome to the Exsys Selector RuleBook. RuleBooks are expert system development environments that are tailored to building specific types of system. The RuleBook environment is written in the context of the domain and greatly simplifies building the system. RuleBooks are far more than typical "Wizards" that only help setup a system. RuleBooks are full development environments that allow a system to be incrementally built, tested, modified and maintained.

RuleBooks are based on the same technology as Exsys CORVID. Finished systems can be delivered with the included CORVID Applet Runtime that is very easy to incorporate into a Web page, or the powerful optional CORVID Servlet Runtime that allows the full power of HTML to be used for complex user interfaces and integration into existing Web sites.

### Selector

**Knowledge, not Just Data:** The Web has become most company's primary means of contacting customers. It is fast and effective, with the ability to deliver vast amounts of data. However, when making a purchasing decision, especially from among a group of similar and confusing products, customers need more than data - they need expert knowledge. Providing only data and specifications on a mix of products requires that the customer find, read and understand all the data. If the data is confusing or overwhelming, the customer will not be confident they are selecting the correct product, they will not make the purchase and may even go somewhere else.

Exsys Selector RuleBook systems allow actual expert knowledge to be directly delivered to the customer via the Web. The system will recommend the best products for the customer's requirements using a conversational customer interface that emulates the interaction the customer would have with an expert salesperson. The system asks the user questions about their requirements and use of the product. Based on this input, logical rules in the system rank the products and find the best ones for the specific customer needs. Each selected product can be displayed with a detailed report on how it matches the customer's individual requirements. The customer is given accurate and specific recommendations that they can act on immediately. Rules describe the logic for ranking a product, with the actual product data and specifications maintained in a spreadsheet file that can be easily updated and maintained.

Selection is the process of examining a group of similar or related items to find the one(s) that best meet a individual's specific requirements. Often, no individual item will meet all the user's requests, and the process of selecting the "best" one is based on considering the how well each item meets the various requirements, weighting the importance of the requirements and finding the best overall recommendation. The user is then presented with the best choices, and an explanation of how they meet, or do not meet, their specific requirements.

The traditional approach to product selection has been using a data base approach. The customer was asked to select various specifications and then a data base was searched to find any products that match all the specifications. If even a single specification was missed, that product would be rejected. This frequently resulted in that the system telling the user that there is no appropriate product for them. This is like having a salesperson in a store say "Sorry we don't have precisely what you want, go away". That salesperson would not last long - but many companies use the equivalent as their virtual salesperson on the Web. Instead, a skilled salesperson would say "Tell me more about how you plan to use the product and I will find the best product for your needs." and explain about the products. That is the type of interaction that a Selector RuleBook system will bring to your Web site.

The most common selection problem is recommending the best Product from a group of related products based on a customer's needs, requests, budget, etc. The Exsys Selector RuleBook is ideal for Product Selection problems, but it can also be used for many other situations that call for selecting items based on multiple competing factors with probabilistic rankings. This includes problems in probabilistic identification, selecting a best course of action, dynamic content generation, and even some types of diagnostic systems. However, all of these are conceptually the same as "product selection", though the "product" may be an identification, action, item of content or diagnosis.

## Building a System

Despite the sophisticated logic and advice of an Exsys Selector system, building the systems is quite easy. The Exsys Product Selector RuleBook uses a notebook style interface. Building a product selection expert system is as simple as working down the tabs to perform 6 steps:

- 1 Define the Attributes that differentiate the various products
- 2 Define the Questions to ask the user
- 3 Define the Criteria that rank products based on how well the Attributes match the user's requirements
- 4 Build a list of Products in a spreadsheet and fill in the Attributes of each Product
- 5 Design the User Interface screens to ask questions and present the system's recommendations
- 6 Run the system

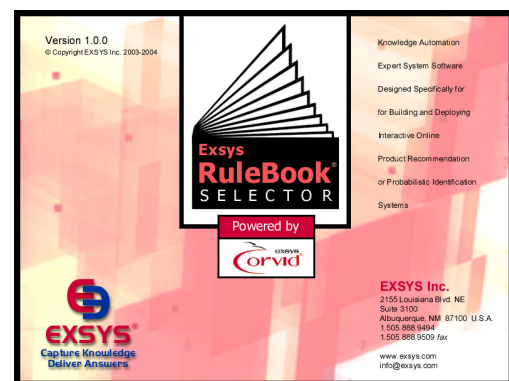
## Starting a System

In this tutorial, you will be building a small Exsys Selector RuleBook system for cell phones. You should follow along using the Selector RuleBook program to actually build a system.

First open the Exsys Selector RuleBook. This can be done by going to the Start Menu and selecting:

**Programs \ Exsys \ RuleBooks \ Selector RuleBook \ Selector**  
or click on the Selector RuleBook icon:

This will display the starting screen. To start a new system, click the "Start a New System" button. If you are using the evaluation version of Selector RuleBook, or have purchased the



full version but not yet registered it, the Welcome to the EXSYS Selector Rulebook screen will be displayed. This window shows that your copy of Selector RuleBook has size and time limitations. If you are using the evaluation version, click the "Start Exsys Selector RuleBook" button at the bottom of the window. The evaluation version will run for the number of days specified, and you will be limited to building systems of no more than the specified number of Criteria. This is plenty to run the tutorial and build some small systems. To purchase Selector RuleBook contact [info@exsys.com](mailto:info@exsys.com) or check [www.exsys.com](http://www.exsys.com).

If you have purchased the full Exsys Selector RuleBook, click the "Send Info" button and follow the instructions for registering with EXSYS Inc. Once your registration is verified, you will be sent an activation code for your computer. Copy that code into the edit box and click the Register button. While you are waiting for the activation code, you can run the program in the evaluation mode. This will enable you to run the tutorial and build small systems. Once the program is registered and fully activated, this window will no longer be displayed on start-up and there will be no limitations on the program.



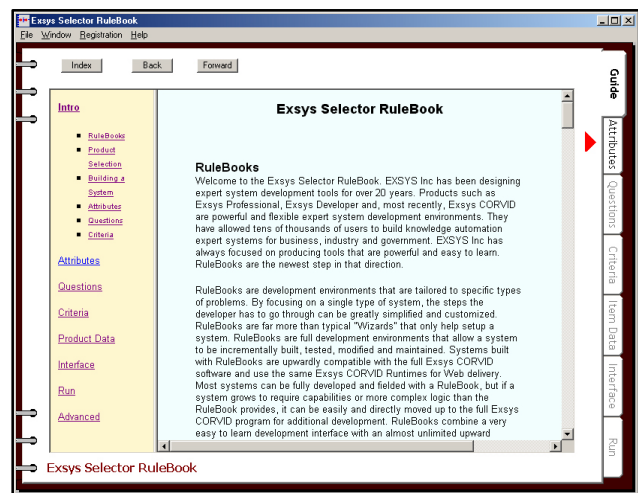
**(If you have already started building the tutorial system, click the "Open an Existing System" button and select the system you started.)**

## Name Your System

First you need to give the new system a name. The standard MS Windows dialog for saving files will be displayed. Call the system **BestPhone**. For this tutorial, the system can be built in any convenient directory, but you may wish to use "**Program Files \ Exsys \ RuleBooks \ Selector RuleBook \ Tutorial**".

## The Guide Tab

Once you have named the new system, the Exsys Selector RuleBook will be displayed. It uses a notebook format with 7 tabs for the various steps in building a system. The top tab is the **Guide** tab. This displays the on-line manual. The left side column is a Table of Contents to quickly goto the section you are looking for. The Guide tab is easily accessible for quick reference. The Guide will display information related to where you are in the system. If you click on the Guide tab from the Criteria tab, it will display instructions related to Criteria.





The "Note" Attribute is used for any note or comment about the product. This is not used in the selection Criteria, but is just a convenient way to store comments about each product for use in the final recommendation report if that product is recommended, or just to internally document the system. The "Note" Attribute is not required, but it is very useful.

## Adding an Attribute

The system you are building will need several new Attributes. To add an Attribute, click the "Add New Attribute" button. This will display the Add Attribute window.

There are 4 types of Attributes with different types of associated values. **It is important to set the Attribute Type correctly since it cannot be changed later in the system.**

**Multiple-choice List:** This is used for Attributes that have a fixed list of possible values. The list of values will be used when entering product details in the spreadsheet. This is the easiest type of Attribute to work with since the list of values is defined and limited. The list can be short (e.g. Yes / No) or long (e.g. a list of all the states in the US.), however it must have at least 2 values. List Attributes are very flexible, make a system easier to read/maintain and should be used whenever practical.

The screenshot shows the 'Attribute' dialog box. It has a title bar with 'Attribute' and a close button. Below the title bar is a 'Help' button. The main area contains a text field for 'Attribute Name:'. Underneath is a 'Type of Value' section with four radio button options: 'List of Values - Value can be selected from a list of possible values' (selected), 'Numeric - Value is a number', 'Text String - Value is text (Normally used for comments and link URLs.)', and 'Image - Value is an image file to be displayed'. Below this is a 'List of Possible Values' section with a 'Value:' text field, an 'Add New Value' button, and a list area with 'Edit Value', 'Delete Value', 'Move Up in List', and 'Move Down in List' buttons. At the bottom, there is a 'Description (Optional):' text field, a checkbox for 'Build Corresponding Question', and 'Cancel' and 'Done' buttons.

**Numeric:** This is used for Attributes that have a value that is a number. Numeric Attributes should be used whenever there is a large range of possible numeric values or when a mathematical comparison of the Attribute with user values will be made.

**In some cases, it can be difficult to decide between a List type and Numeric type for an Attribute. For example, the number of doors in a car. It is numeric, but there are only a few possible values and no mathematical calculation or range would be needed. In that case, even though the value is numeric, it makes more sense to use a List Attribute.**

**On the other hand, if you have 10 phones in a system, you could list the 10 possible prices in a Multiple-choice List, but it would be difficult to maintain the system as the prices changed. Also, the selection logic would need to mathematically compare the price with customer's budget. That can only be done with a Numeric Attribute. So, the "Price" Attribute should be a numeric.**

**Text:** This is a type of Attribute that is used for text information that can be used in the recommendation report, but which is not used in the decision-making logic. The "Product" Attribute for the product name is a Text String. It contains the name of the product. The "Note" Attribute that was automatically added is also a Text String Attribute. Text Attributes can be used for URL addresses to display Web pages with details on a Product.

**Image:** This is a special type of Attribute that is used only for the name of an image file (JPG or GIF) that will be displayed in the report of recommendations. Normally there is only a single image Attribute in a system, but there can be more than one. The image is typically displayed in the report at the end if that product is recommended. The image can be linked to a URL so that a click on the image will open a browser window with more information on the product.

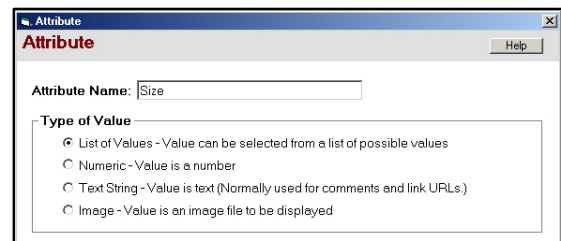
## The "Size" Attribute

The first Attribute in your cell phone selector system will be a simple one on the size of the phone. Phones are available in 3 sizes - standard rectangular "candy bar" size, small folding phones and some which are even smaller and considered "very small". The "Size" Attribute will be a List Attribute and will have values of "Standard", "Small" and "Very Small".

**The system could consider actual dimensions of the phone, but that would make the decision logic much more complicated. Also, it is not the way a customer actually selects a phone. Based on how the phone is carried, the customer may need a smaller type phone, or may be able to use a standard phone. This is a difference that is important in the selection logic. A small difference in actual physical dimensions would not have much significance. This is a case, where it is better to use a List Attribute even though the underlying data is actually numeric.**

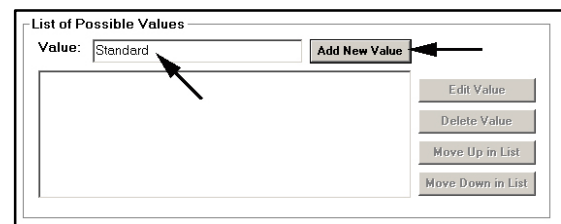
To add the new Attribute:

- If you have not already done so, click the Attribute tab to display the Attribute page
- Click the "Add New Attribute" button to display the Add Attribute window
- In the "Attribute Name" edit box, enter "Size".
- Since this Attribute has a list of possible values, it is a List Attribute, so leave the "List of Values" radio button checked.



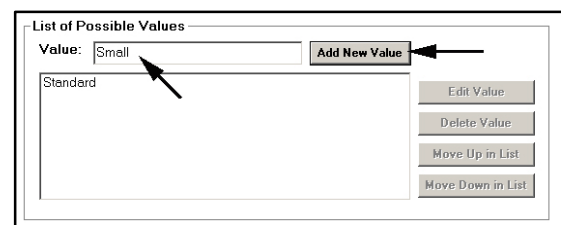
Now to add the Values. In this case, the values to use are "Standard", "Small" and "Very Small". In the List of Possible Values box:

- Enter the first value "Standard"
- Click the Add New Value button



This will add the value to the list. Now add the second value in the same way:

- Enter the Second value "Small"
- Click the Add New Value button



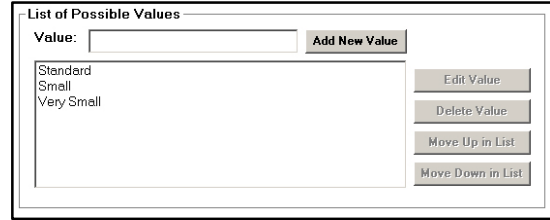
This will add the "Small" value to the list.



Now add the last value in the same way:

- Enter the Second value "Very Small"
- Click the Add New Value button

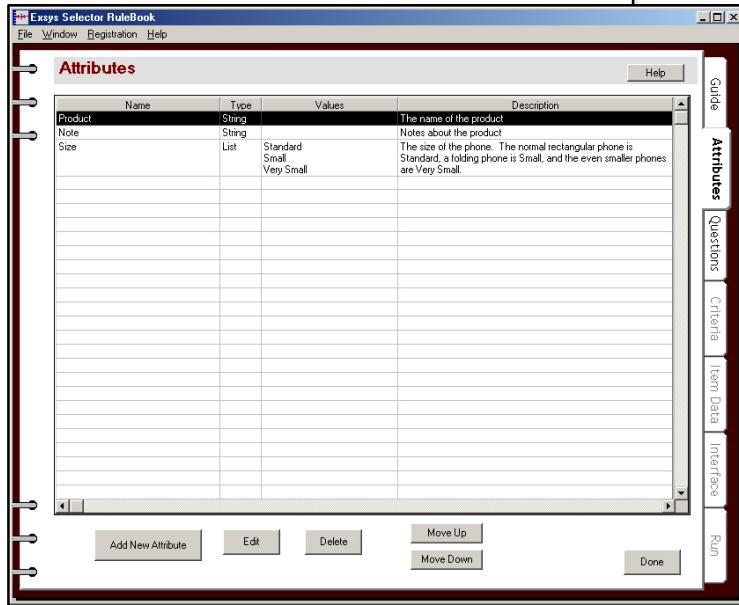
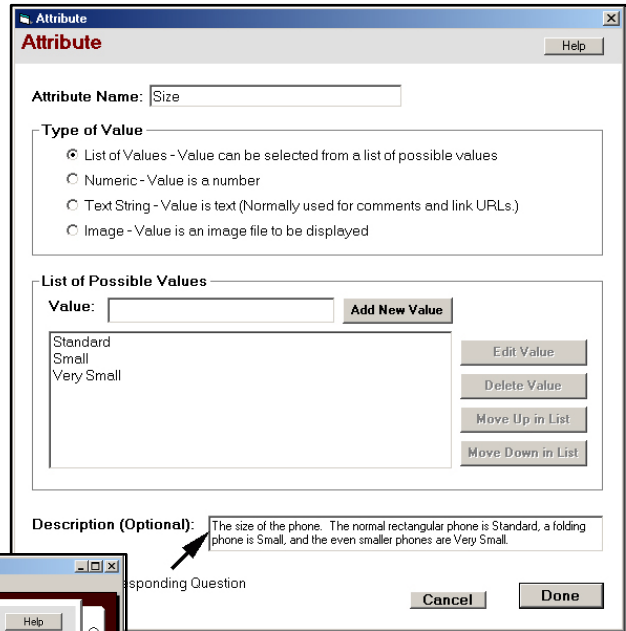
The window should now look like:



Once values have been added to the list, they can be edited, deleted or rearranged using the buttons on the right. When a value is selected, by clicking on it, the buttons on the right become active.

That is all that is needed to add an Attribute, but it is often a good idea to add a Description of the meaning of the Attribute. If the Attribute is self-explanatory, the description is not needed. However, if you (or others that may have to maintain the system) may not understand the meaning, the Description is a handy place to explain it.

In the Description edit box, enter *"The size of the phone. The normal rectangular phone is Standard, a folding phone is Small, and the even smaller phones are Very Small."*



That is all that is needed for this Attribute, so click the Done button. This will return to the Attribute tab, but now the new Attribute has been added to the list.

The first new "Size" Attribute has been added to the system.

## Adding More List Attributes

In the same way, now add other Attribute. One of the factors that will be considered is if the phone has built-in games. This would be a List Attribute named "Games", with values of:

- No
- Some
- Many

This will provide enough values to cover all the possible cases, and allow for future phones.

**This is again a case where a Numeric Attribute could be used to hold the actual number of games supported on the phone. However, it is better to use a list whenever possible. Also, the list approach is easier to maintain as phones change. Today, 4 games might be "standard" and 8 would be "Many". In a year, 8 may be "standard" and 20 would be "Many". The phones can be ranked based on the current standards, and the system can select phones based on how strongly they are ranked. If a customer says games are important to them, phones that support "Many" will be more highly ranked - regardless of what specific number "many" represents in the future.**

Click the Add New Attribute button and enter the name and values. As before, add the values one at a time, entering the text in the edit box and clicking the "Add New Value" button. Once all the values are added, the window should look like:

Attribute

Attribute Name: Games

Type of Value

- List of Values - Value can be selected from a list of possible values
- Numeric - Value is a number
- Text String - Value is text (Normally used for comments and link URLs.)
- Image - Value is an image file to be displayed

List of Possible Values

Value: [ ] Add New Value

- No
- Some
- Many

Edit Value

Delete Value

Move Up in List

Move Down in List

Description (Optional): [ ]

Build Corresponding Question

Cancel Done

Click the Done button to add the "Games" Attribute to the system.

Exsys Selector RuleBook

Attributes

Name	Type	Values	Description
Product	String		The name of the product
Note	String		Notes about the product
Size	List	Standard Small Very Small	The size of the phone. The normal rectangular phone is Standard, a folding phone is Small, and the even smaller phones are Very Small.
Games	List	No Some Many	

Add New Attribute Edit Delete Move Up Move Down Done

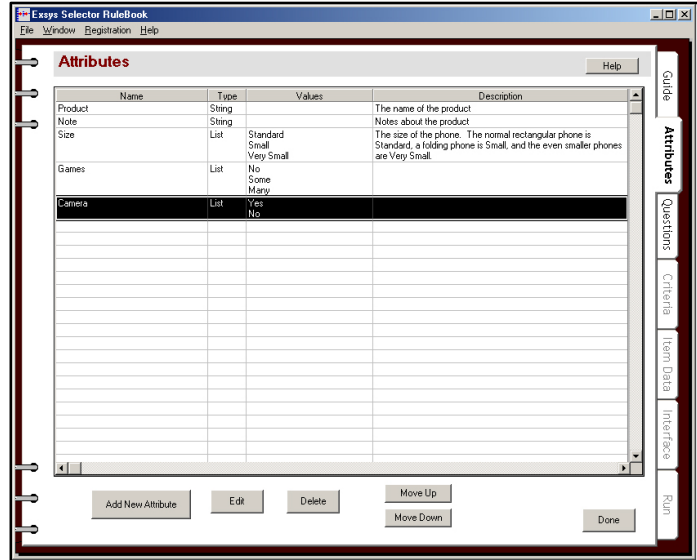
Now, in the same way, add 1 more List Attribute on whether the phone has a built-in camera.

Name: **Camera**

Values:

- **Yes**
- **No**

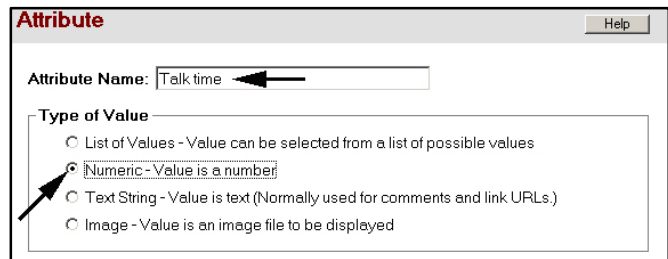
The Attribute page should now look like:



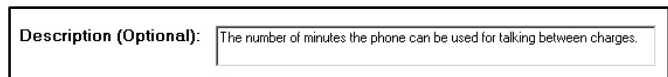
### Adding Numeric Attributes

So far, all the Attributes have been Multiple-choice List with a specific list of possible values. But, there are other types of Attribute. An factor that should be considered in the selection of the phone is the "talk time" - the amount of time the phone can be used between charges. This can be numeric values over a wide range, so it would be difficult to handle as a List. Instead, you will add a Numeric Attribute. To add a Numeric Attribute:

- Click the "Add New Attribute" button
- Enter the Attribute name "**Talk time**"
- In the list of Types, click the "Numeric" radio button. This will disable the controls on the screen for adding values



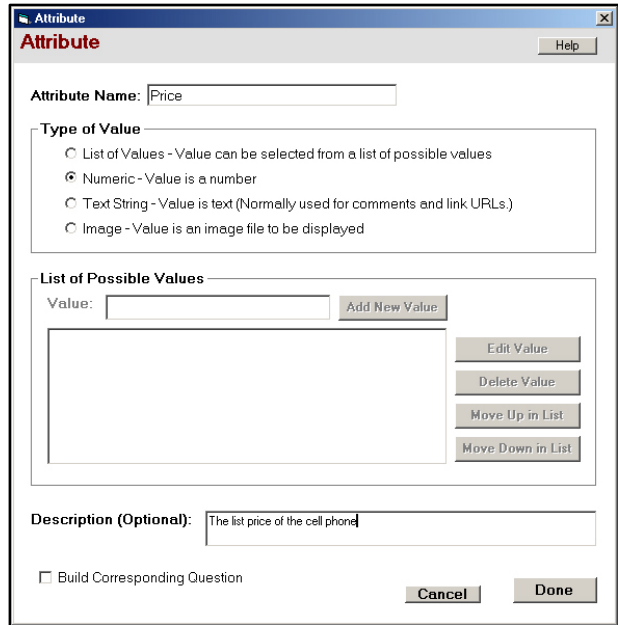
When adding any Attribute that might require an explanation, it is always a good idea to add a Description. In this case, you want to document that the time should be measured in minutes, so add the Description "The number of minutes the phone can be used for talking between charges."



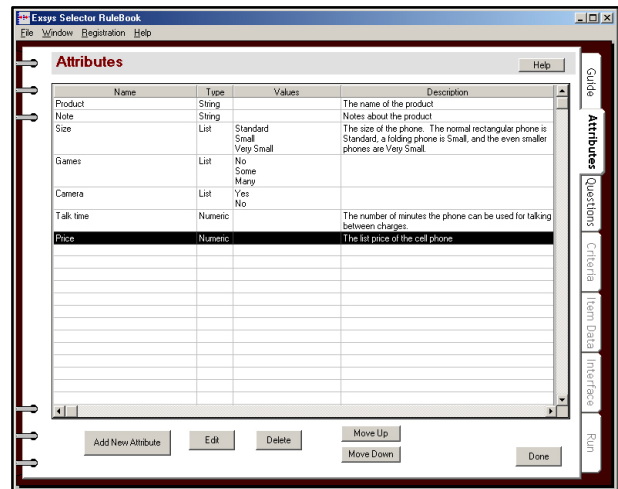
Click the "Done" button to add the "Talk time" Attribute to the system.

Now add one more Numeric Attribute for the price of the phone. This will be used to recommend phones within the customer's budget.

- Click the "Add New Attribute" button
- Enter the name "**Price**"
- In the list of types, click the "Numeric" radio button. This will disable the controls on the screen for adding values
- For the Description, enter "The list price of the cell phone"
- Click the "Done" button



The Attributes tab should now look like:

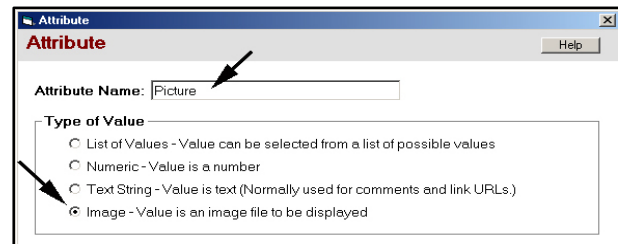


### Adding an Image Attribute

In the results screen, you want to show a picture of the phones that are recommended. To do this you use an Image Attribute. It will hold the name of a image file for the phone. This file can be a JPG or GIF image.

To add a Image Attribute:

- Click the "Add New Attribute" button
- Enter the name "**Picture**"
- In the list of types, click the "Image" radio button. This will disable the controls on the screen for adding values



Add the Description "The picture of the phone as a JPG"

Description (Optional):

Click the "Done" button to add the Attribute to the system.

## Adding a Text Attribute

One last Attribute to add. In the results screen, you want to add a URL link to the picture of the phone. If the customer wants more information, they can just click on the picture to be linked to the page of information. To do this you use a Text Attribute. This type of Attribute can hold any text string or note, but here it will hold the URL address for the page to link to. To add a Text Attribute:

- Click the "Add New Attribute" button
- Enter the name "Link"
- In the list of types, click the "Text String" radio button. This will disable the controls on the screen for adding values

Attribute Name:

Type of Value

- List of Values - Value can be selected from a list of possible values
- Numeric - Value is a number
- Text String - Value is text (Normally used for comments and link URLs.)
- Image - Value is an image file to be displayed

Add the Description "The HTML page to link from the picture"

Description (Optional):

Click the "Done" button to add the Attribute to the system.

That is all the Attributes you will need in the system. The Attribute page should now look like:

Name	Type	Values	Description
Product	String		The name of the product
Note	String		Notes about the product
Size	List	Standard Small Very Small	The size of the phone. The normal rectangular phone is Standard, a folding phone is Small, and the even smaller phones are Very Small.
Games	List	No Some Many	
Camera	List	Yes No	
Talk time	Numeric		The number of minutes the phone can be used for talking between charges.
Price	Numeric		The list price of the cell phone
Picture	Image		The picture of the phone as a JPG.
Link	String		The HTML page to link from the picture

## The Number of Attributes to Use

There is no specific number of Attributes that should be used to build a system. It is best to start with a relatively short list of the most important Attributes that covers all the major factors in deciding among products. Others can always be added later. Remember, each Attribute will typically have a corresponding Question, which the user must answer, so you also need to consider how many questions you want to ask the customer.

If two products have the same values for all their List and Numeric Attributes, they are effectively identical to the system. The products in the system will be separated by differences in their List and Numeric Attribute values. If many products end up with the same values for all Attributes, you may need to add more Attributes to differentiate them.

### Remember:

- **Attributes are characteristics or features of the Products**
- **Add the Attributes that will be used to decide between Products**
- **Use a List of Values if possible. Otherwise, use Numeric for numbers, Image for pictures and Text String for everything else.**
- **Add descriptions to document specifically what the Attribute means**

## Questions

Questions are used to ask the end user (customer) for the data that will define their particular requirements and preferences. This data will be compared to the Attributes for each product to find the best match(s) - even when a product cannot exactly meet all the user requests.

In many respects Questions are like Attributes. Both can have lists of possible values or accept a numeric value. However, **Attributes are the characteristics of the products** and **Questions are requests for data from the customer**. The Attributes for each product will be the same for each run of the system. The Question values will change with each customer that runs the system.

As you will see later, Criteria provide rankings that compare the possible values of a Question with it's associated Attribute. Typically, each Attribute that is part of the selection process will have an associated Question to ask the user for their requirement on that Attribute.

In some systems, the customer can simply be directly asked for their preference on each of the Attributes. This is a very simple type of interface to build and Exsys Selector can even build the Questions for you. Questions can be automatically built from the Attributes by selecting the "Build Corresponding Question" check box when building the Attribute. As each List or Numeric Attribute is added, a corresponding Question is automatically built. This Question will have the same name as the Attribute, but start with "USER\_" to distinguish it from the Attribute and will be displayed with a blue background on the Questions tab.

However, most systems will use Questions that do not exactly match the Attributes and instead ask about how the customer will use the product. This generally produces a better customer interface and does not require the customer to be familiar with the meaning and consequences of selecting a specific Attribute value. It also allows Questions that indicate how important a particular feature is to the customer. In this system, instead of directly asking about Attribute values, the "indirect" questions will be related to the Attributes in the Criteria.

## The Questions Tab

Click on the Questions tab.

The page is blank since there are no Questions in the system yet.

## The User Question Screen

To add a new Question, click the "Add New Question" button on the Questions tab. This will display the User Question window.

This window is in many ways very similar to the Add Attribute window, but there are some important differences.

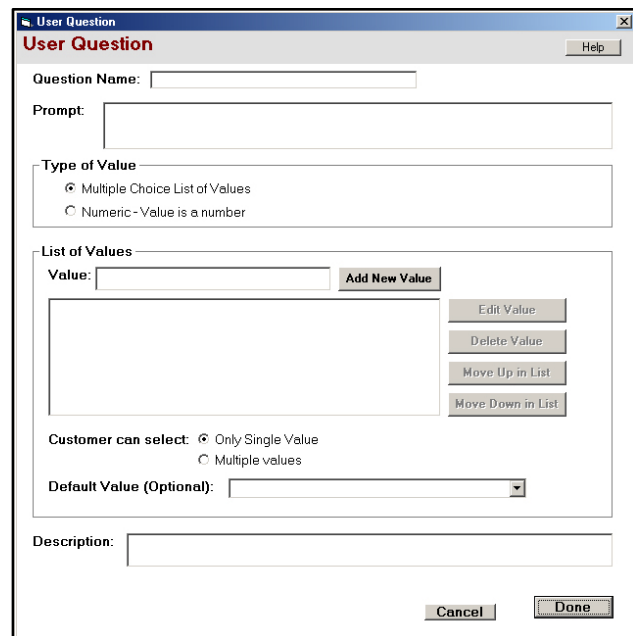
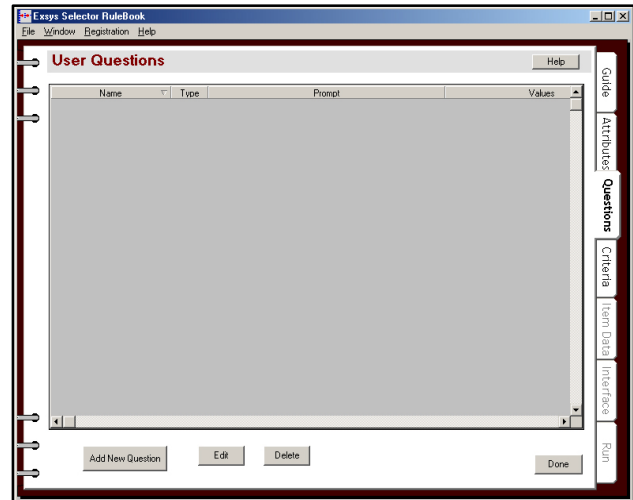
**Name:** Each Question must have a Name. This is how the Question will be referenced in the system. The name should be fairly short, but descriptive.

**Prompt:** Unlike Attributes, Questions have Prompts. This is the text that will be displayed to the customer when asking for their input. The prompt should clearly describe what is being asked, and include any special information such as expected units (e.g. Please enter the length in inches).

**Type of Value:** The values for a Question can only be multiple-choice Lists or Numeric.

**List of Values:** For multiple-choice List Questions, the value list is built exactly the same as for an Attribute and with the same controls. You can also specify if the customer can select only one value from the list or multiple values. (This will be implemented by using the appropriate controls in the Runtime). In addition, a Default value can be set. This value will be preselected when the Question is asked. (It should be the "safe" or expected value.) If the customer just hits the Enter button, this value will be used. The Default value is optional. If it is not set, no value will be preselected.

**Description:** This is the same as for Attributes. Any text to explain, document or remind you of the intent of the Question can be added. This text is only for your use and has no effect on the actual running of the system.



## Adding the Questions

First you will add a simple Question on the camera feature. This is an example of an indirect Question, rather than asking for one of the related Attribute values (Yes / No). This Question will be used to both indicate if a camera is desired, and how important that feature is. The Question will ask if the customer want a camera in the phone with values:

- Not needed
- Desired, but not important
- Very important

The customer's input will allow the system to rank phones on the "camera" feature. The 3 values indicate the degree to which the feature is important to the customer.

Adding a Question is very similar to adding an Attribute, but the Question has a Prompt. This is the text that will be displayed to the user when asking the question. If the Question is a multiple-choice list, the question will be the combination of the Prompt with the values. If the Question is Numeric, the Prompt will be followed by an edit box where the user can enter the numeric value. To add the Question, enter these values in the User Question window:

**User Question**

Question Name:

Prompt:

Type of Value:

- Multiple Choice List of Values
- Numeric - Value is a number

List of Values:

Value:

Not needed  
Desired, but not important  
Very important

Customer can select:  Only Single Value  
 Multiple values

Default Value (Optional):

Description:

- For the Question Name enter "**Need camera**"
- For the Prompt, enter "Having a camera built into the phone is:"
- For the type, select "Multiple-Choice List"
- In the Value edit box, enter "Not needed" and click the "Add New Value" button
- Repeat step 4 for the values: "Desired, but not important" "Very important"
- Select that only a single value can be selected
- Do not set a default value
- This is self-explanatory, so it does not need a Description

Click the "Done" button to add the Question to the Question tab.

Name	Type	Prompt	Values
Need camera	List	Having a camera built into the phone is:	Not needed Desired, but not important Very important



Next you will add a Question for the Attribute "Games" which has values "Yes" and "No". This will be handled the same way as the "camera" feature. The user will be asked to indicate how important having games built into the phone is, with values:

- Not needed
- Desired, but not important
- Very important

To add the Question, click the "Add New Question" button and enter these values:

- For the Question Name enter **"Need games"**
- For the Prompt, enter "Having games built into the phone is:"
- For the type, select List
- Enter the values "Not needed" and click the "Add New Value" button
- Repeat step 4 for the values: "Desired, but not important" "Very important"
- Select that only a single value can be selected
- Do not set a default value
- This is self-explanatory, so it does not need a Description

Click the Done button to add the Question to the list on the Questions tab.

Name	Type	Prompt	Values
Need camera	List	Having a camera built into the phone is:	Not needed Desired, but not important Very important
Need games	List	Having games built into the phone is:	Not needed Desired, but not important Very important

Now add a multiple choice list Question on size. This Question will cover the size of phone the customer wants. Since, in general, people always prefer a smaller phone, the question asks how important this factor is to the customer.

Add this Question just as before.

Question Name: Size needed

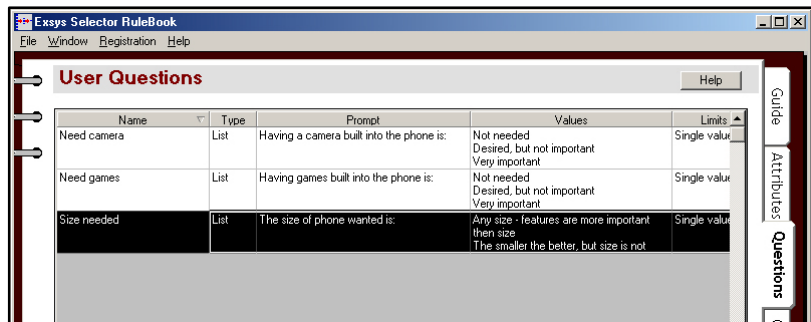
Prompt: The size of phone wanted is:

Values:

- Any size - features are more important than size
- The smaller the better, but size is not critical
- A small size is very important

Only a single value can be selected and there is no default value

When you add this Question, and the Questions tab should look like:



Now for the last list Question. This Question will cover the how long the customer typically uses the phone between charges. This will be used with the Attribute "Talk time". One approach would be to ask the customer for the number of minutes that they want, however asking for a precise number is not usually a good idea. It is better to use a List to generally describe how the customer will use the phone. This will typically get better information from the customer, and make the system better since the customer selects their typical usage rather than a specific number of minutes.

Add this Questions just as before.

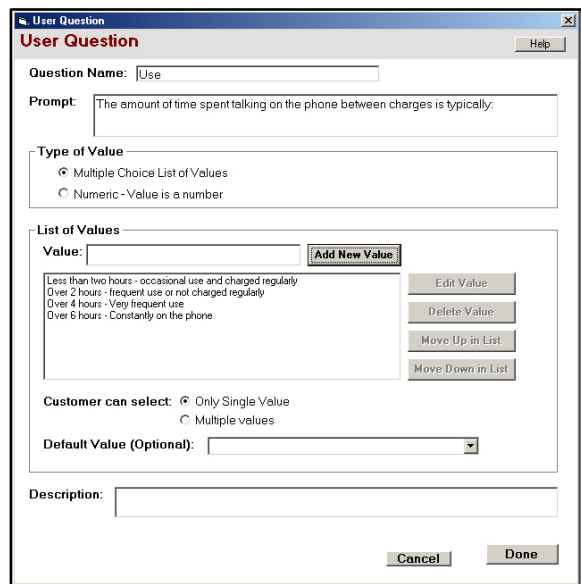
Name: Use

Prompt: The amount of time spent talking on the phone between charges is typically:

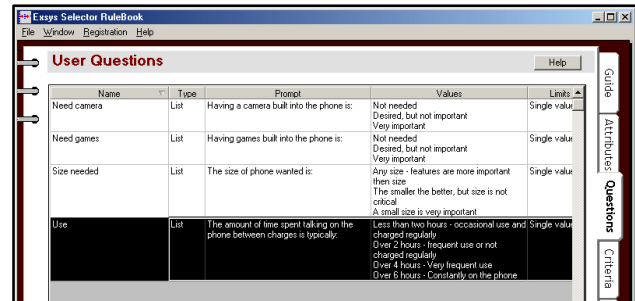
Values:

- Less than two hours - occasional use and charged regularly
- Over 2 hours - frequent use or not charged regularly
- Over 4 hours - very frequent use
- Over 6 hours - constantly on the phone

Only a single value can be selected and there is no default value



Click "Done" to add this Question and the Questions tab should look like:



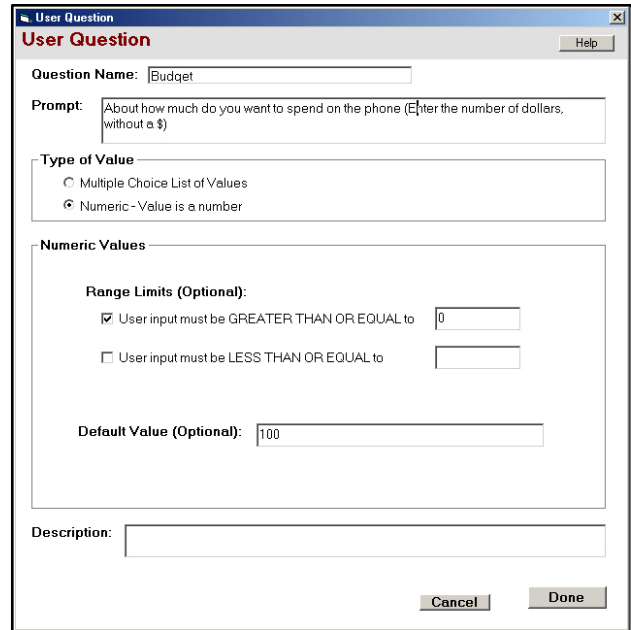
## Adding a Numeric Question

The system now needs one more Question on the customer's budget for the phone. Since this could be any number, a Numeric Question should be used. It will use a default value of "100" to indicate that this is about the range of number that is expected and to illustrate the format of input that is expected. Range limits will be used to make sure that the customer enters a value greater than 0.

Name: Budget

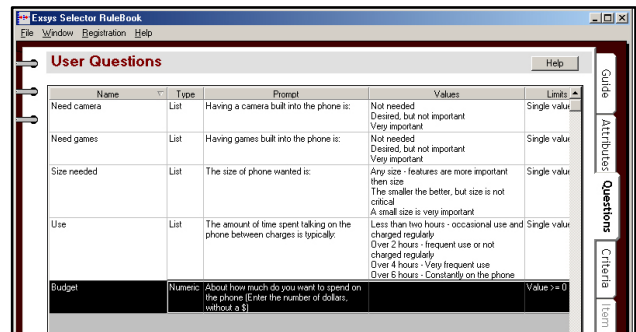
Prompt: About how much do you want to spend on the phone (Enter the number of dollars, without a \$)

Default value: 100



Click the "Add New Question" button.

1. For the Question Name enter "**Budget**"
2. For the Prompt, enter "About how much do you want to spend on the phone (Enter the number of dollars, without a \$)"
3. For the type, select Numeric - this will change the lower window
4. In the Range Limits, enter "0" in the "User input must be GREATER THAN OR EQUAL TO" edit box. This will automatically select the associated check box.
5. Leave the second Range Limit box empty
6. For the Default value enter "100"



Click the Done button to add this Question to the Question tab.

That is all the Questions that will be needed to build the system. Typically there is one Question for each Attribute that is involved in the selection (List and Numeric Attributes)

**Remember:**

- Questions are what the customer will be asked to indicate their requirements and preferences
- Questions on the intended use of the products generally make a better user interface than just asking about Attributes
- Ask Questions that the user will be able to answer
- When asking for a numeric value, be sure to include units if there might be confusion.
- Only ask Questions that are relevant to the decision process

## **End of Lesson 1**

At this point you should save the system you have built by selecting the "Save" option under the "File" menu. You can then continue on with Lesson 2 on building the Criteria or do Lesson 2 later.

## Lesson 2 - Criteria

### Opening the System

If you are continuing on from Lesson 1 and still have Selector RuleBook open, just continue below.

If you finished Lesson 1, saved your system and exited, open that system by clicking the "Open an Existing System" button on the starting screen and browse to your system. The file should be **BestPhone.slrp** in the folder, "**Program Files \ Exsys \ RuleBooks \ Selector RuleBook \ Tutorial**".

If you do not have a system from Lesson 1: Open the file "Lesson2Start.slrp" from the tutorial folder. This is the system built using the steps in Lesson 1. The default location for this file is "Program files \ Exsys \ RuleBooks \ Selector RuleBook \ Tutorial". Once the file is open, select "**Save As**" from the "File" menu and save it as "BestPhone" in the Tutorial directory. Be sure to save with "**Save As**" so you are working on a copy and NOT the original of this file, since you may want to run this tutorial again later.

### Attributes and Questions

The Attributes and Questions for the system were added in Lesson 1.

#### Attributes:

Name	Use
Product	The name of the product, in this case the name of the phone
Note	Any extra text about the phone that should be included with the recommendation
Size	The size of the phone, with values of "Standard", "Small" and "Very small"
Games	The built-in support for games on the phone, with values of "No", "Some" and "Many"
Camera	Whether or not the phone has a built-in camera
Talk Time	The number of minutes the phone can be used for talking between charges
Price	The list price of the phone in dollars
Picture	The name of JPG file with and image of the phone
Link	A URL link to a Web page with more information on the phone

## Questions:

Name	Use
Need camera	The customer's preference for having a built-in camera in the phone. The customer can also indicate how important this feature is.
Need games	The customer's preference for having a built-in games in the phone. The customer can also indicate how important this feature is.
Size needed	The customer's preference for the size of the phone.
Use	The amount of time that the customer typically spends on the phone
Budget	The amount that the customer is willing to pay for the phone

## Criteria

Selection Criteria are the heart of a Selector system. Each Criteria focuses on a specific aspect of the decision, and compares the possible values for a Question (user request) with the possible values for an Attribute (Product capability). The Criteria ranks all the possible combinations.

When the system runs, the Criteria work with specific user input and the Attribute values for each product to rank how well it meets the user requests. When the rankings for all the Criteria are combined, the system finds the "best" products. Criteria also allow text comments to be added to the report on each product for the combinations of Question and Attribute values. A spreadsheet matrix of possible combinations compares all possible cases systematically.

Each Criteria has:

- A Question that defines the values the user can request for a feature or capability
- An Attribute that defines the possible values that a product could have
- A spreadsheet matrix ranking each combination of Question and Attribute values
- A measure of how important this particular criteria is in the overall selection of the "best" product

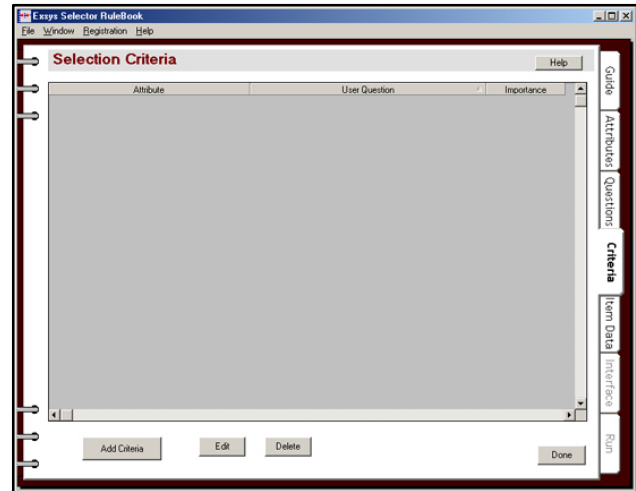
**Each Criteria only covers one aspect of the overall selection process.** This makes it easy to focus on that aspect. A full system will have many Criteria that cover various aspects of the selection process. When the system is run, all the Criteria will be used and incorporated into the overall decision process. Both text list and numeric factors can be included in Criteria.

## Criteria Tab

The Criteria are displayed by selecting the Criteria Tab on the right side of the window. The window shows all the Criteria in the system with their properties.

There are 3 columns:

- Attribute**      The product Attribute used to build the Criteria
- Question**      The user Question used to build the Criteria
- Importance**    A ranking of how important this Criteria is in the overall selection of a “Best” product. The values are:



- Critical - The most important Criteria. Failure to meet this Criteria can eliminate a product
- Important - A major factor to consider in making a selection, but not critical
- Secondary - A minor factor to consider that would not be the main basis for a selection, but would allow deciding among products that received equal rankings from the other Criteria.

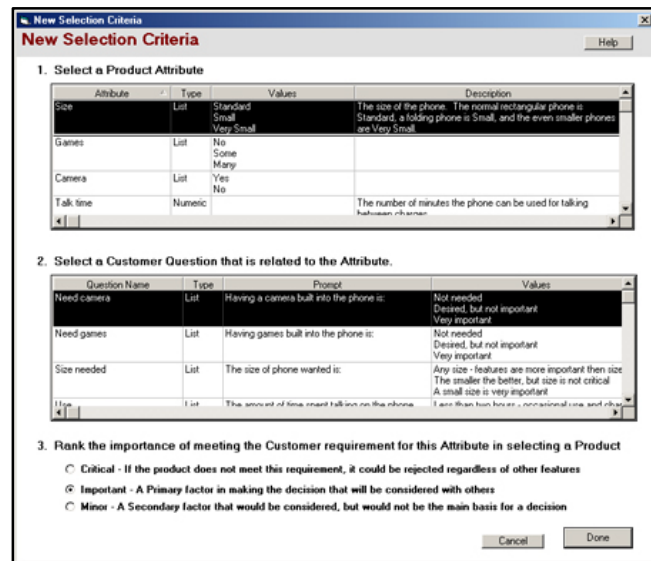
## Adding a Criteria

To add a Criteria, click the "Add Criteria" button on the Criteria Tab. This will display a “New Selection Criteria” window for selecting the Attribute and Question to compare and the importance level of the Criteria.

This window has 2 lists to select from. The top is the Attributes in the system. The lower is the Questions in the system. At the bottom is the importance level of the Criteria, which indicates how heavily this Criteria should be weighted in the overall decision.

First, add a simple Criteria that will rank the "Camera" Attribute with its related Question "Need camera".

1. Click on the row for the Attribute "**Camera**" to select it in the top list
2. Click on the row for the Question "**Need camera**" in the lower list



This is an important aspect of the decision, but not "Critical", it will be set as "Important".

- Click the radio button next to "Important" at the bottom of the window.
- Click the "Done" button to build the Criteria. This will open the window for adding the ranking values for this Criteria.

**Note:** To make the spreadsheet easier to read, the width of the columns can be moved by clicking in the header row on the divider line between columns. The divider can then be moved left or right to change the width of the columns. The overall window can also be resized.

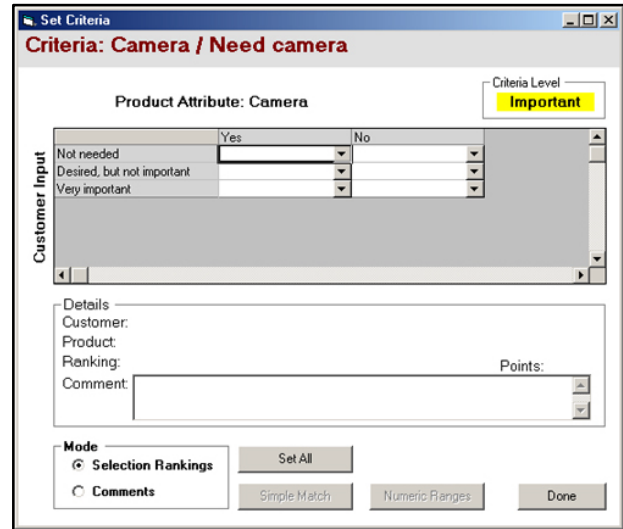
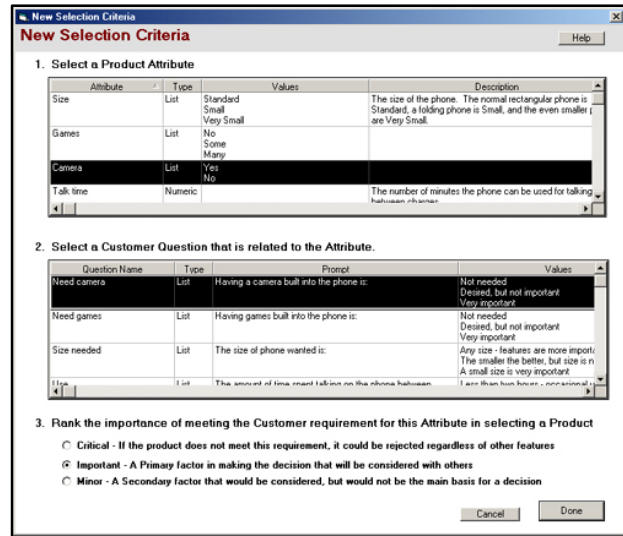
### Setting the Ranking Values

The rankings in each Criteria are set in a spreadsheet where the column headers are the possible Attribute values and the rows are the possible Question values. This creates a matrix of cells, one for each possible combination. A ranking is added in each cell that indicates how "Good" or "Bad" a product would be if the Customer selected the Question value and the Product had the Attribute value.

This ranking is **based on this single Criteria** by itself. It is important to remember that this factor in the selection should be considered independent of any other factors - those will be worked into the system through other Criteria.

Each cell will have a ranking. The default possible values are:

- Very Good** - a product is an excellent match to the customer's needs, extremely positive
- Good** - a product matches the customer's needs well, very positive
- Fair** - a less appropriate match, but still positive
- No significance** - The factor does not matter in the selection of the product
- Poor** - not a good match, slightly negative
- Bad** - a very poor match, very negative
- Very Bad** - an extremely poor match, extremely negative
- Reject** - Such a poor match on a Critical Criteria that the product should be rejected for this reason alone. (This is only available in Critical Criteria.)

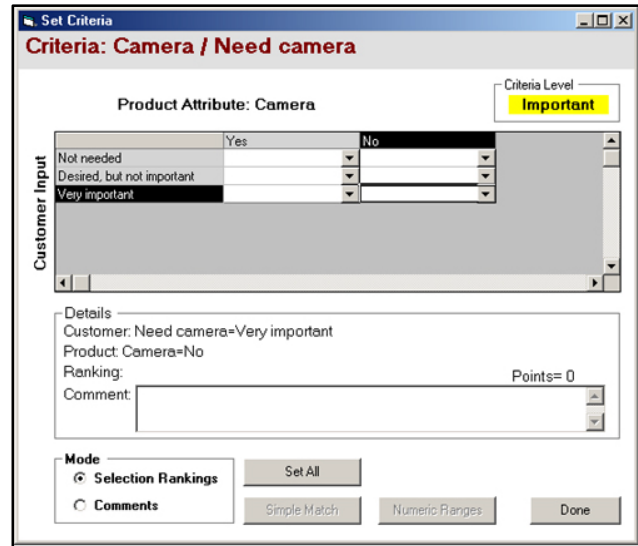




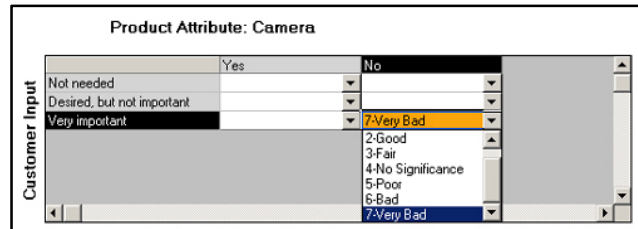
Each ranking value actually translates to a point score that is added to, or subtracted from, the overall score for each product. The sum of the scores for all the Criteria is the overall score for a product. The product(s) with the highest scores are the best match to the customer's requirements. (There are ways to change the text and point scores for the ranking values, but for this system the defaults will be used.)

Each cell has a drop down list that makes it easy to set the value. Either click the drop down arrow and select a value, or select a cell and enter the number of the value from the list (1=Very Good, 2=Good, 3=Fair, etc.)

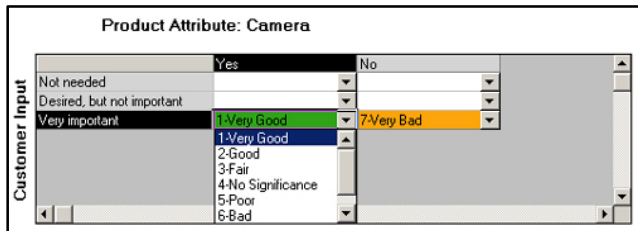
Looking at the Criteria matrix, click on the lower right cell to select it. Notice that when a cell is selected, the Details block in the center of the window displays the text of the Question and Attribute, making it easy to check the condition that the cell applies to.



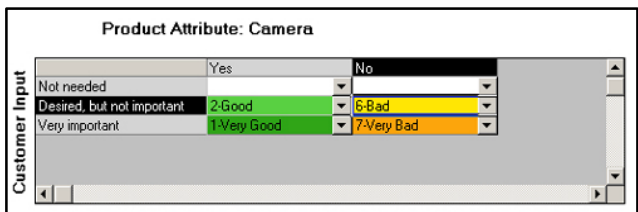
In this case, the cell applies to the case where the customer has indicated a camera is very important to them. If a particular phone does not have a camera, that would not be a good recommendation for this customer. The cell should have a ranking of "Very Bad". Click the drop down list and select "Very Bad". (You may need to scroll down to find the value.)



Next set the cell for the situation where the customer indicates a camera is important and the phone has a camera. This is the lower left cell. In this case, based on this Criteria alone, the phone would be a "Very Good" recommendation. Click on the lower left cell and set the value of "Very Good".



Now for the next row up. In this case, the customer has indicated that they would like a camera, but it is not important. Since the customer puts less emphasis on this factor, the rankings will be "Good" and "Bad", rather than the "Very Good" and "Very Bad" rankings used below where this was a more important factor. A ranking of "Bad" will not have as great an overall effect on the recommendation as a ranking of "Very Bad".



Set the rankings of "Good" and "Bad".

Now to fill in the top row. This is where the customer has indicated that a camera is not needed. In that case, it does not matter if the phone has a camera or not - the selection will be made on other factors. When an Attribute has no effect on the decision, it should be given a value of "No significance". Set the 2 cells in the top row to "No significance".

Product Attribute: Camera		
Customer Input	Yes	No
Not needed	4-No Significance	4-No Significance
Desired, but not important	2-Good	6-Bad
Very important	1-Very Good	7-Very Bad

That is all that is needed for the rankings in the first Criteria.

## Comments

In addition to rankings, a Criteria can be used to add comments to a report. Remember, that the overall selection will be based on all the Criteria in a system. Even though this Criteria may give a low ranking to a product, other Criteria may give it high rankings and that product may be one of the best overall. When that product is recommended, the customer should be told that while it is best overall, it does not have some of the features that were requested. The Exsys Selector RuleBook makes it easy to build this type of customized report on each product that explains exactly how a product matches the customer's requirements.

If the customer has indicated that a camera is very important, and a phone without a camera is recommended (due to other Criteria), the report on that product should include that the phone does not have a camera. The cell for this situation is in the lower right. Click on that cell to select it.

The "Details" block in the middle of the window shows the Question, Attribute and Ranking. To add a comment for this cell, just enter it in the Comment edit box. In this case, enter "This phone does not have a camera."

Comment: This phone does not have a camera.

Any time the combination of customer Question value and product Attribute value uses this cell, the comment will be added to the report. In many cases, that specific product will NOT actually be recommended, and the report will not be used. However, **comments should always be written assuming the product will be recommended.**

Each cell can have a comment, but most do not need them. The most important cases are to point out desired features that are not present in a product. The same comment should also be added to the cell for the middle right

cell where the customer indicated that they want a phone (though it is not as important) and phone does not have a camera. In this case, the ranking was not as low, but the same comment can be used.

Click on the middle right cell and enter the comment "This phone does not have a camera."

The comments can be added at the same time as the rankings. This requires entering them one at a time. Sometimes it is easier to see all the comments to make sure they have been added to all the appropriate cells. To change the spreadsheet to display only the comments, click on the "Comments" radio button in the Mode section. This will display all the comments.

Comments can also be used to highlight a feature that the customer has asked for. In this case, it can be used to point out phones that have cameras, but only for customers that have indicated that this is a feature they want.

Enter the comment "This phone has a built-in camera." for the lower 2 left cell where the customer has indicated they want a camera. Just click on the cell and either enter the comment into the cell or the in Comment edit box below.

It is not necessary to add comments for the top row since that is a situation where the customer indicated that a camera was not needed, so it does not matter if the phone has one or not.

That is all that is needed for the first Criteria.

Using any combination of customer input and product Attribute for the camera, it can rank the phone on this aspect and, where relevant, add a comment to the report on the phone.

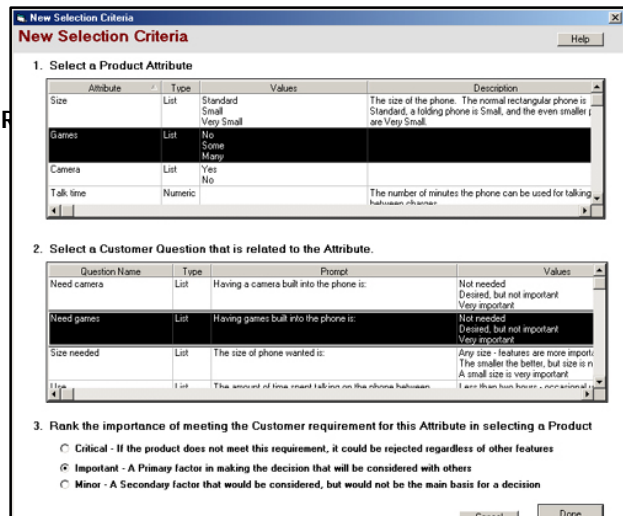
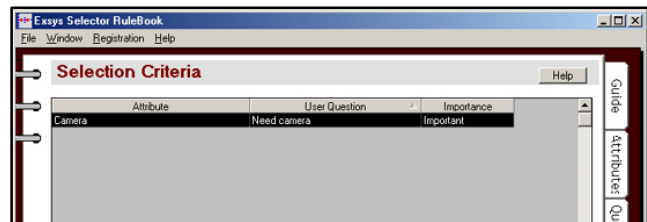
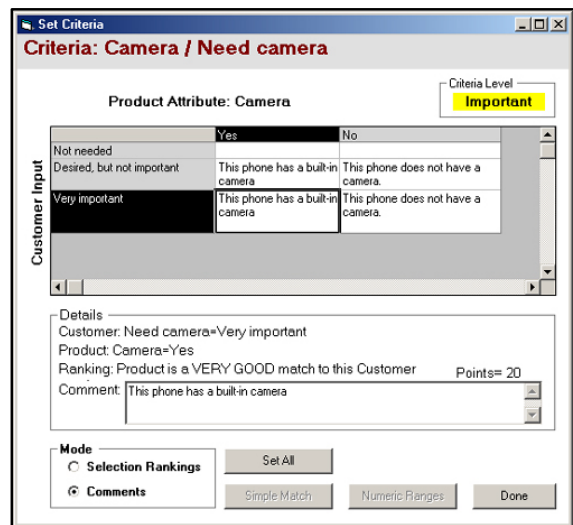
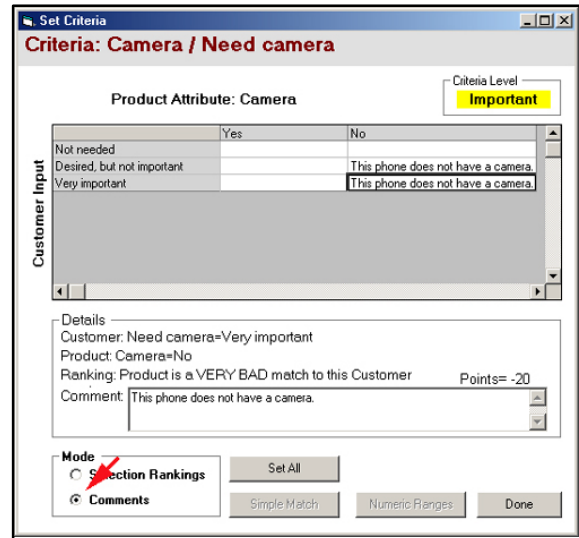
Click the "Done" button. This will add the Criteria to the list on the Criteria tab.

Building a full system is just a matter of adding more Criteria to cover all the aspects of the selection process.

Select "Save" under the "File" menu to save your current system.

## Adding More Criteria

Exsys Selector F



Now using the same approach add a Criteria for the Games Attribute.

- Start a new Criteria by clicking the "Add Criteria" button
- Select the Attribute "Games" and the Question "Need Games".
- Set the importance level at "Important"

Click the "Done" button to start building the Criteria. Set the ranking values as shown below.

Product Attribute: Games			
Customer Input	No	Some	Many
Not needed	4-No Significance	4-No Significance	4-No Significance
Desired, but not important	5-Poor	3-Far	2-Good
Very important	7-Very Bad	2-Good	1-Very Good

Now add some Comments. These can be added by selecting the individual cells and entering the comment, or by clicking the Comment radio button to see all the comments in the Criteria.

In the "Many" column, add the Comment "This phone has many games." in the lower 2 rows. In the "Some" column add "This phone has some games." in the lower 2 rows and in the "No" column, add "This phone does not have any games." Click the "Done" button to save the Criteria.

Product Attribute: Games			
Customer Input	No	Some	Many
Not needed			
Desired, but not important	This phone does not have any games.	This phone has some games.	This phone has many games.
Very important	This phone does not have any games.	This phone has some games.	This phone has many games.

Now add a Criteria on Size.

- Start a new Criteria by clicking the "Add Criteria" button
- Select the Attribute "Size" and the Question "Size needed".
- Set the importance level at "Important"

Product Attribute: Size			
Customer Input	Standard	Small	Very Small
Any size - features are more important then size	4-No Significance	4-No Significance	4-No Significance
The smaller the better, but size is not critical	2-Good	1-Very Good	1-Very Good
A small size is very important	5-Poor	2-Good	1-Very Good

Set the ranking values as shown to the right.

Add the Comments as shown to the right.

Product Attribute: Size			
Customer Input	Standard	Small	Very Small
Any size - features are more important then size			
The smaller the better, but size is not critical	A standard size phone.	A small phone.	A very small phone.
A small size is very important	A standard size phone, larger than some other models.	A small phone.	A very small phone.

Click the "Done" button to add the new Criteria to the list.

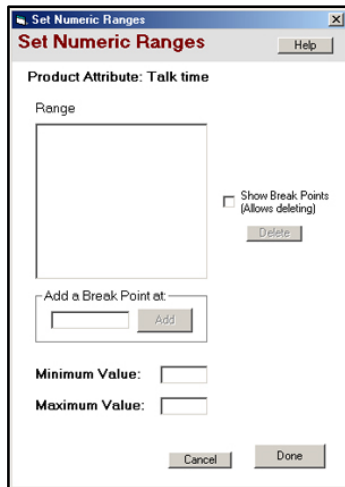
### Criteria with Numeric Attributes

So far all the Criteria have used lists for both the Attribute and Question. Building that type of Criteria is quick and easy since all the possible values are specified. However, Criteria can also be built using Numeric Attributes and Questions. First you will build a Criteria where the Attribute is numeric and the Question is a list. This will be the Criteria comparing the Attribute "Talk time" which is numeric, with the Question on "Use" which is a list.

- Start a new Criteria by clicking the "Add Criteria" button
- Select the Attribute "Talk time" and the Question "Use".
- Set the importance level at "Important"
- Click the "Done" button

A message will be displayed stating that to compare a Numeric Attribute with a List, the Attribute values must be assigned ranges. Click the "OK" button on this message window.

The Criteria matrix is made up of rows and columns. For a multiple-choice List, the headings are just the possible values. However, when the Attribute or Question is Numeric, there are many possible values and they cannot be directly used for the headings. Instead, ranges of values must be defined that will be used as the headings.



The "ranges" are set of values that can be handled the same in the Criteria. The ranges are defined by break points. There can be as many ranges as needed. This is done in the "Set Numeric Ranges" window.

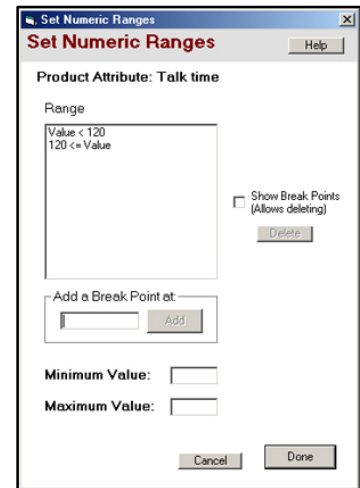
Ranges are defined by the Break Points. In this case, the value of the Attribute "Talk time" is from about 120 minutes to 500 minutes. There are many ways this could be broken into ranges, but you want ranges that will work well with the associated "Use" Question in this Criteria. That Question has values of:

- Less than two hours - occasional use and charged regularly
- Over 2 hours - frequent use or not charged regularly
- Over 4 hours - Very frequent use
- Over 6 hours - Constantly on the phone

The simplest ranges to set up that would match the Question are to set break points at 2, 4 and 6 hours (or 120, 240 and 360 minutes). To do this:

- Enter "120" in the edit box under "Add Break Point at"
- Click the "Add" button

The window now shows 2 ranges, broken at 120.



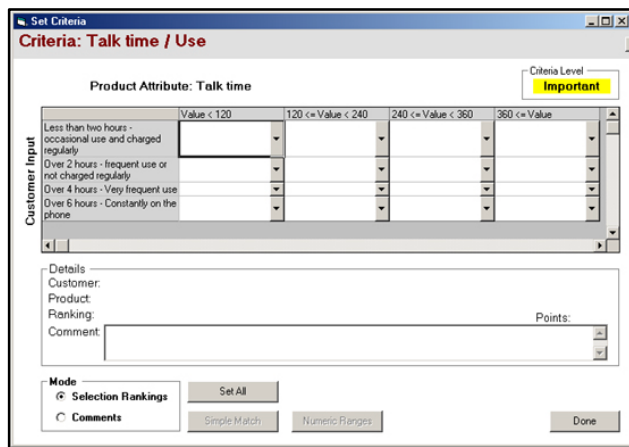
To add the other 2 break points:

- Enter "240" in the edit box under "Add Break Point at"
- Click the "Add" button
- Enter "360" in the edit box under "Add Break Point at"
- Click the "Add" button

Range
Value < 120
120 <= Value < 240
240 <= Value < 360
360 <= Value

The window now shows all the ranges that will be needed.

**In addition to the break points, maximum and minimum values can also be added - but those are not needed in this case. To edit a range, you must edit the break points. Click the "Show Break Points" check box. This will display the list of break points. Click the break point you wish to change to select it and click the "Delete" button to delete it. Then add a new break point the usual way. Break points can be added in any order - RuleBook will automatically sort them into numeric order.**



Those are all the ranges that will be needed, so click the "Done" button on the Range window. Now the normal Criteria window is displayed, but with the Ranges as the column headings.

The ranking values and Comments are now set just like any other Criteria. Set the values as shown below:

	Value < 120	120 <= Value < 240	240 <= Value < 360	360 <= Value
Less than two hours - occasional use and charged regularly	2/Good	1/Very Good	1/Very Good	1/Very Good
Over 2 hours - frequent use or not charged regularly	5/Poor	1/Very Good	1/Very Good	1/Very Good
Over 4 hours - Very frequent use	7/Very Bad	5/Poor	1/Very Good	1/Very Good
Over 6 hours - Constantly on the phone	7/Very Bad	7/Very Bad	5/Poor	1/Very Good

Now add Comments.

Click "Comments" in the "Mode" box in the lower right and enter the following comments.

	Value < 120	120 <= Value < 240	240 <= Value < 360	360 <= Value
Less than two hours - occasional use and charged regularly	A phone with somewhat limited talk time. You may need an extra battery or more frequent charging.	A phone with enough talk time for your normal use.	A phone with plenty of talk time.	A phone with plenty of talk time.
Over 2 hours - frequent use or not charged regularly	A phone with somewhat limited talk time. You may need an extra battery or more frequent charging.	A phone with enough talk time for your normal use.	A phone with plenty of talk time.	A phone with plenty of talk time.
Over 4 hours - Very frequent use	A phone with very limited talk time. You will need extra batteries and more frequent charging.	A phone with somewhat limited talk time. You may need an extra battery or more frequent charging.	A phone with enough talk time for your normal use.	A phone with plenty of talk time.
Over 6 hours - Constantly on the phone	A phone with very limited talk time. You will need extra batteries and more frequent charging.	A phone with quite limited talk time. You will need an extra battery or more frequent charging.	A phone with somewhat limited talk time. You may need an extra battery or more frequent charging.	A phone with plenty of talk time.

## Adding a Numeric / Numeric Criteria

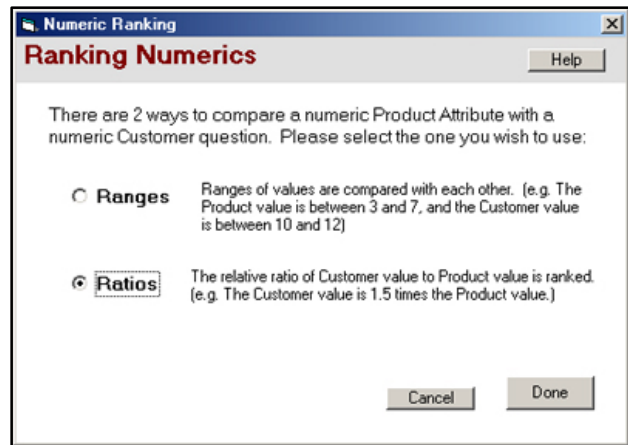
The previous Criteria used a numeric Attribute with a list Question. This required defining ranges for the numeric part. But what about Criteria that use both numeric Attributes and numeric Questions. The Selector RuleBook has 2 ways to handle these.

The first approach is to define ranges for both the Attribute and Question, just as in the previous Criteria. These are then used as the row and column headers, and the Criteria is built as before.

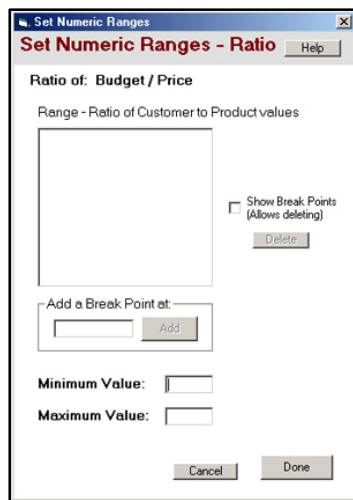
The second approach is for cases where the important factor is the ratio of the 2 numbers rather than the specific values. This is particularly useful for Criteria that rank the price of the product against the customer's budget.

The exact numbers do not matter as much as the price being over budget. That is the type of Criteria that will be added next.

Start the new Criteria by selecting the Attribute "Price" and Question "Budget". Set the importance level to "Important". This will display a new "Ranking Numerics" window:

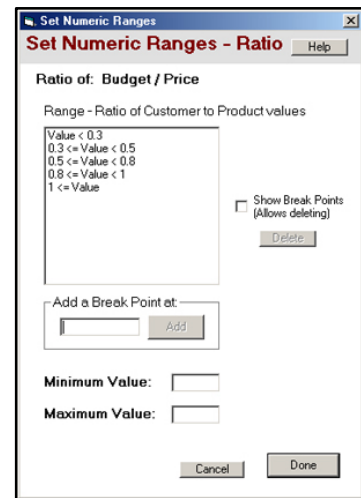


Since this is a Criteria with both a numeric Attribute and a numeric Question, you must decide if it will use separate ranges for the Attribute and Question, or a ratio of the values. In this case select "Ratios", and click the "Done" button.

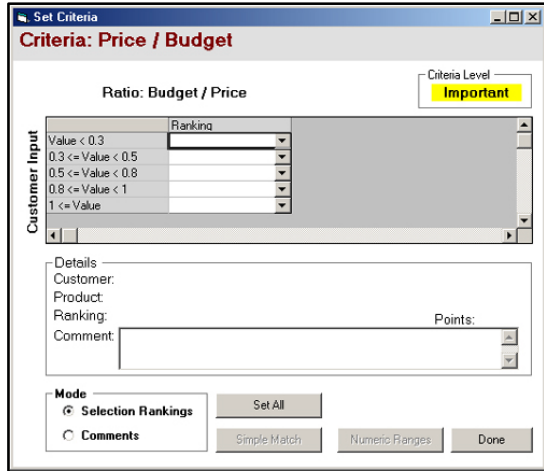


Now you have a window for defining the ratios. Even though you are using ratios, ranges will need to be defined, however, here the values are the **ratio** of the values. As before, the ranges are defined by break points. But this time these are ratios of "Budget" to "Price". A value of "1" means the budget value equals the price. A value of 1.5 means the budget is 1.5 times the price. A value of .6 means the budget is only 6/10 of the price. A value of .1 means the budget is 1/10 the price.

In general, any price that is under budget can be grouped together, so there will be a break point at "1".



Enter 1 in the edit box under "Add Break Point at" and click the Add button. Now add break points for .8, .5 and .3. That will be enough ranges, so click the "Done" button.



Notice that the Criteria has only a single column of rankings. (Any Criteria that uses ratios will always only have a single column.)

Now the values can be filled in as before. Add the following rankings.

Ratio: Budget / Price	
Customer Input	Ranking
Value < 0.3	7-Very Bad
0.3 <= Value < 0.5	6-Bad
0.5 <= Value < 0.8	5-Poor
0.8 <= Value < 1	2-Good
1 <= Value	1-Very Good

**Note:** Remember the ratio is the Question value divided by the Attribute value. Be sure not to get these reversed or the system will give the opposite recommendations from what is intended.

Now add Comments by clicking the "Comments" radio button in the lower right and enter the following comments:

The Comments can be used to point out that a product is under, or over, budget. Remember to always add comments assuming that the product has been selected as one of the recommended products by the overall Criteria.

In this case, a comment says. "The price is higher than your budget, but a good match on features". This is a valid comment, since the Customer will only see the comment if the product is recommended, which means it received high rankings from other Criteria on features.

Product Attribute: Price	
Customer Input	Comments
Value < 0.3	The price is far higher than your budget, but a good match on features.
0.3 <= Value < 0.5	The price is considerably higher than your budget, but a good match on features.
0.5 <= Value < 0.8	The price is higher than your budget, but a good match on features.
0.8 <= Value < 1	The price is a little higher than your budget, but a good match on features.
1 <= Value	The price is less than your budget.

That is all the Criteria that will be needed. There are still a few Attributes that have not been used, but those are for the report rather than part of the decision making logic.



**Remember:**

- **Criteria are the core of the selection logic**
- **Criteria compare an Attribute and related Question to rank all possible combinations**
- **Each Criteria should rank the product based on that factor independent of any others**
- **Keep ranking levels consistent to provide a valid weighting of factors**

## **End of Lesson 2**

That is all that needs to be done to add the Criteria to the system. At this point you should save the system you have built by selecting the "Save" option under the "File" menu.

You can then continue on with Lesson 3 on adding product data, building the user interface and running the system, or do Lesson 3 later.

## Lesson 3 - Adding Data and Running Systems

### Opening the System

If you are continuing on from Lesson 2 and still have Selector RuleBook open, just continue below.

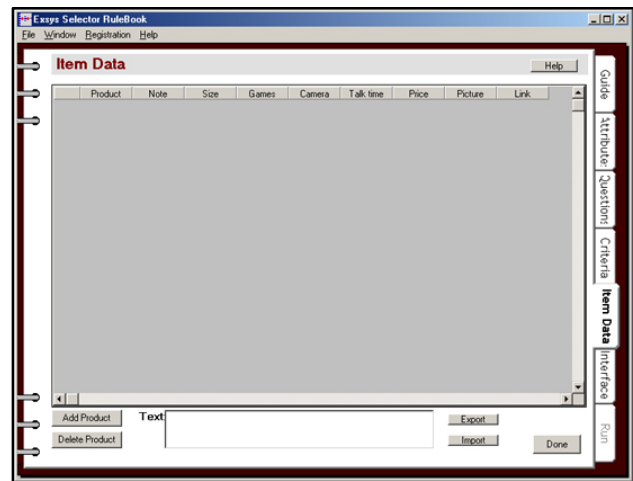
If you finished Lesson 2, saved your system and exited, open that system by clicking the "Open an Existing System" button on the starting screen and browse to your system. The file should be **BestPhone.slrb** in the folder, "**Program Files \ Exsys \ RuleBooks \ Selector RuleBook \ Tutorial**".

If you do not have a system from Lesson 2: Open the file "Lesson3Start.slrb" from the tutorial folder. This is the system built using the steps in Lesson 2. The default location for this file is "Program files \ Exsys \ RuleBooks \ Selector RuleBook \ Tutorial". Once the file is open, select "**Save As**" from the "File" menu and save it as "BestPhone" in the Tutorial directory. Be sure to save with "**Save As**" so you are working on a copy and NOT the original of this file, since you may want to run this tutorial again later.

### Adding Product Data

So far, the system has been built using Attributes and ranking Criteria that could be applied to any product. This allows the system to separate the decision-making logic from the details of the products or items. The product details are maintained in a separate spreadsheet file. The logic (Attributes, Questions and Criteria) does not have to be changed as product details change or new products are added. Only the product data spreadsheet file needs to be updated.

The product data file can be maintained in a spreadsheet program such as Excel, but it is easier to do it within the Selector RuleBook. To add / edit product data, click on the **Item Data** tab.

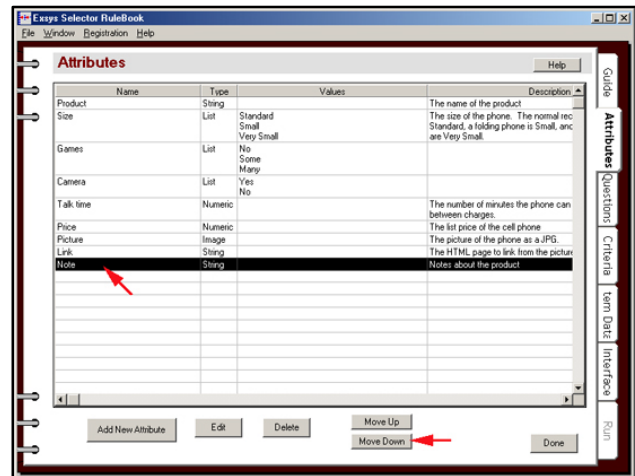


There are not yet any products in the system, so the tab only shows the column headings. These headings are the Attributes that are defined in the system. They are in the same order as the Attributes.

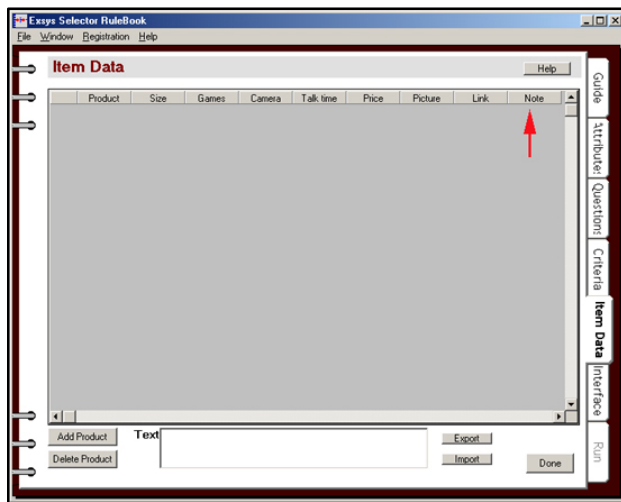
The order does not make any difference to the running of the system, but if you would prefer the columns in a different order, just click the Attribute tab, and use the "Move Up" and "Move Down" buttons to change the order. For example, it is often convenient to have the "Note" column be on the right.

To move it to the right:

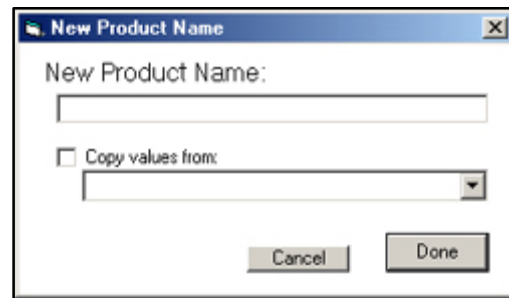
- Click on the Attribute tab to open it.
- Click on the row for the "Note" Attribute
- Click the "Move Down" button until the "Note" Attribute is the last in the list.



Now click on the Item Data tab and the columns will be in the new Attribute order.



Each product or item in the system will have a row of data. To add a product, click the "Add Product" button. This will open a window that asks for the product name.



Each product must have a **unique** name. After some products have been added to the spreadsheet, you can also choose to copy the Attribute values from another product when the new one is added. If there are products that are the same in most Attributes, this can speed data entry since only the differences will need to be edited.

In this system, you will be importing a pre-built spreadsheet of data, but to see how product data is added:

- If you have not already done so, click the "Add Product" button
- Enter a product name of "X123"
- Click the "Done" button on the "New Product Name" window

This will add a new row to the spreadsheet.

Each of the list Attributes has a cell with a dropdown list of the possible values. This makes it fast and easy to select one of the values defined in the system.

For example, to set the size to "Small":

- Click the arrow in the right side of the cell under "Size"
- A drop down list of the allowed values will appear
- Select "Small"

	Product	Size	Games	Camera	Talk time	Price	Picture	Link	Note
1	X123								

Product	Size	Game
1	X123	

- Standard
- Small
- Very Small

The same can be done for the Attributes "Games" and "Camera".

Numeric Attributes such as "Talk Time" and "Price" should have numeric values entered. (Be sure NOT to include non-numeric data such as "\$" in the price or "Min" in the time.)

Text String Attributes can have any data in them. The data entered depends on the nature of the Attribute. The "Picture" Attribute would be the name of a JPG file with an image of the phone. The "Link" Attribute would be a URL address for a Web page with more details on the phone. The "Note" Attribute can include any description or other information that you would want to display to customer if this phone is selected. (You will see later how this is included in reports.)

For Numeric and Text String Attributes, when you click on the cell, the text is also displayed in the edit box at the bottom of the window. You can edit the text in this edit box or directly in the cell. For long text, it is easier to edit it in the edit box.

For a sample, set the data in the first row to:

	Product	Size	Games	Camera	Talk time	Price	Picture	Link	Note
1	X123	Small	No	Yes	240	125.99	X123.jpg	http://www.mysite.com/phones/x123.html	The smallest

- Product: X123
- Size: Small
- Games: No
- Camera: Yes
- Talk Time: 240
- Price: 125.99
- Picture: X123.jpg
- Link: <http://www.mysite.com/phones/x123.html>
- Note: The smallest phone with a built-in camera.

## Sample Data

Rather than having you enter many rows of data, there is sample data already created. This data can be imported into the system.

- If you are not already there, click the "Item Data" tab
- Click the "Import" button at the bottom of the window
- If you have added data to the spreadsheet, a warning message will be displayed. Click "Yes" that you want to continue.
- The standard "Open File" dialog will be displayed, Select the file "SampleData.txt" in the current "tutorial" directory and click "OK"

This will load a set of data into the spreadsheet for a variety of phones.

	Product	Size	Games	Camera	Talk time	Price	Picture	Link	Note
1	V60i	Small	Some	No	250	299.99	v60i.jpg	v60i.html	A small
2	SCH-T300	Small	Some	No	200	99.99	scht300.jpg	scht300.html	A small
3	V120t	Standard	No	No	350	149.99	v120t.jpg	v120t.html	A nice
4	i205	Standard	No	No	165	199.99	i205.jpg	i205.html	An entry
5	C343	Small	Many	No	290	189.99	c343.jpg	c343.html	A small
6	G4010	Very Sma	Many	No	150	199.99	g4010.jpg	g4010.html	A very small
7	i730	Standard	Many	No	200	449.99	i730.jpg	i730.html	A very
8	T722i	Small	Many	No	390	284.99	t722i.jpg	t722i.html	A small
9	T306	Small	Many	Yes	630	174.99	t306.jpg	t306.html	A small
10	T616	Small	Many	Yes	300	299.99	t616.jpg	t616.jpg	An

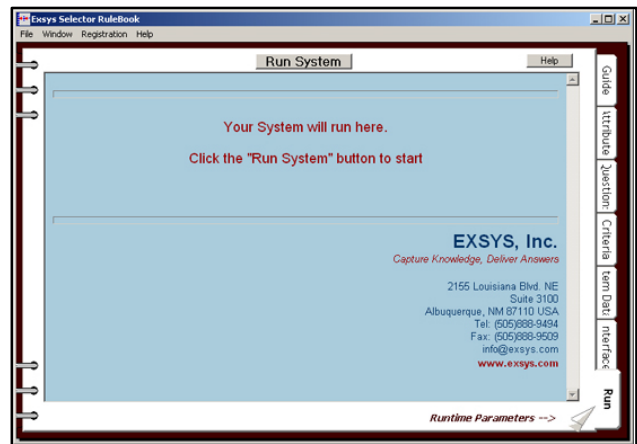
While data on many more phones could be added, this will be enough for this tutorial.

## Running the System

There is now enough entered to run the system. It will be rather plain and simple until you add the user interface, but it will run.

Click on the "Run" tab. This is the tab for running and testing systems.

When a system is run, the Selector RuleBook will build the runtime file for your system. This is a special file that will be read and executed by the CORVID Applet Runtime program that actually runs the systems. Applets are special Java programs that can be included in Web pages. Selector also builds an HTML page with the code to call the CORVID Applet Runtime and load your system. This HTML page is



then run in the Run Tab window, which is actually a Web browser. (Fielding a system is just a matter of putting the HTML page, CORVID applet runtime, and system files on a web server.)

**To start running the system, click the "Run System" button at the top of the Run tab page.**

Whenever this button is clicked the system will restart from the beginning. Clicking the "Run" tab, shows the screen from the last session that was run. You must click the "Run System" button to start a new run and have any changes take effect.

As the system runs, it needs to ask the customer questions about their preferences. These are just the questions that you added to the system earlier. The first question the system asks is about the need for a camera in the phone.

For this sample run, answer that a camera is "Not needed", and click the OK button.

Having a camera built into the phone is:

Not needed

Desired, but not important

Very important

The next question is on games.

For this question, answer "Desired, but not important" and click the OK button.

Having games built into the phone is:

Not needed

Desired, but not important

Very important

The next question will be on the size. Select "The smaller the better, but size is not critical".

The next question is on how much the phone is used. Select "Over 6 hours - constantly on the phone" and click the OK button.

T306 Score= 66.0 This phone has many games. A small phone. A phone with plenty of talk time. The price is less than your budget.

T722i Score= 43.0 This phone has many games. A small phone. A phone with plenty of talk time. The price is a higher than your budget, but a good match on features.

C343 Score= 43.0 This phone has many games. A small phone. A phone with somewhat limited talk time. You may need an extra battery or more frequent charging. The price is less than your budget.

Exsys CORVID

The last question is on budget. Change the default value of "100" to "200" and click the OK button. This finishes the run, and the recommendations are now displayed.

This recommended the appropriate phones, but it is not formatted. This is because you did not yet change any of the interface options from their default values. The default is to show the top 3 recommendations with the product name, the score and any comments. In this case, the T306 received the highest score of 66 points and all the comments were favorable. The other 2 phones

recommended received lower scores and, as the comments show, did not meet the customer's requirements in some way.

The system is producing good recommendations, but it can be displayed more attractively. This is done by formatting the questions and result screen using the Interface Tab.

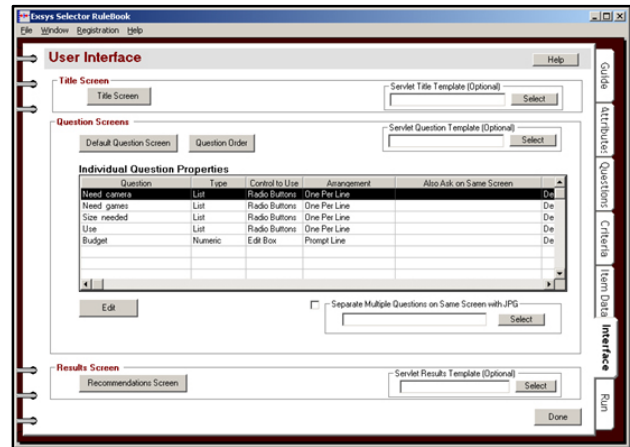
## Controlling the User Interface

Click on the Interface tab.

The interface page appears complicated at first, but actually it is divided into 3 sections:

- Designing a Title screen which is displayed at the start of a run.
- Setting the format for how questions are asked.
- Setting the format for the display of the results.

Each of these screens is designed using the same editing window, though with different options.

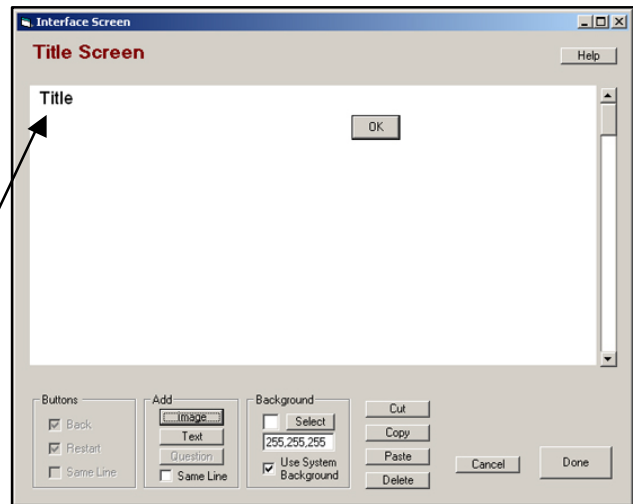


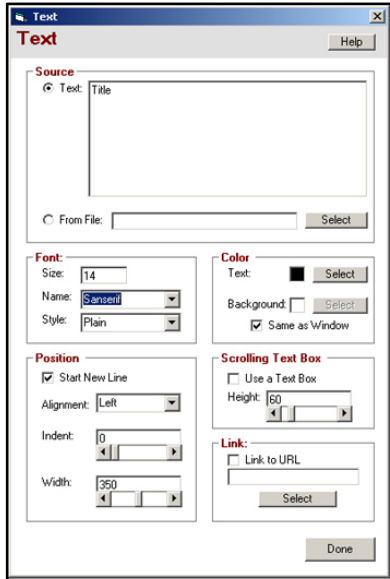
### Adding a Title

The easiest interface option is adding a title. To do this, click the "Title Screen" button at the top of the page.

This displays the window that is used for all the interface options. In this case it is set for the title. Since there was no title screen, it creates one that has just a simple line of text "Title" and an OK button.

First, change "Title" to "Cell Phone Selector". To do this, click on the text "Title" in the window.

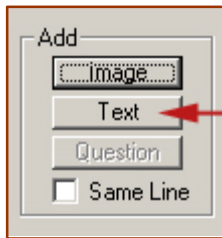




This displays the window for setting the properties of a section of text on the screen. The content of the text, color, size, position, links, etc., can be set from this window.

- In the edit box at the top of the window, change "Title" to "Cell Phone Selector"
- In the Font box, change Size to 24.
- In the Color box, click the Select button to the right of "Text", select a blue color in the color selection window and click OK

As these changes are made, the Title Screen window will change to display them. (You may need to drag the Text Properties window to the side to see this.) The title in the window now looks like:

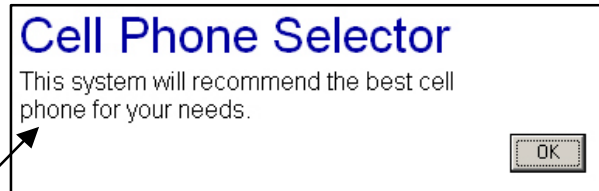


The title screen can contain any number of text items and images (jpg or gif). To add another text item, click the "Text" button at the bottom of the Title Screen window in the "Add" box.

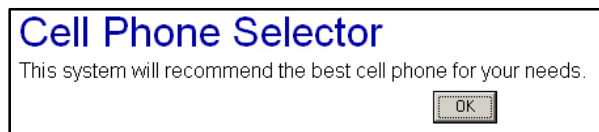
This will add a new text item to the window, containing "Text". The window for editing the properties for that text item will also be displayed.



Make sure that "Text" is selected by clicking on it and in the properties window, change "Text" to "This system will recommend the best cell phone for your needs". The window should now look like:



The second line of text wraps to 2 lines because it is too wide for the width specified. Click on the second line of text to select it. In the Text window, in the "Position" box, change the value for the "Width" slider by moving the thumb, or holding down the right arrow, until the text fits on one line. This will be a value of about 450.



**Text can also be centered and indented to position it as needed. If you want text on the same line as the preceding item, just uncheck the "Start new line" check box in the "Position" box.**

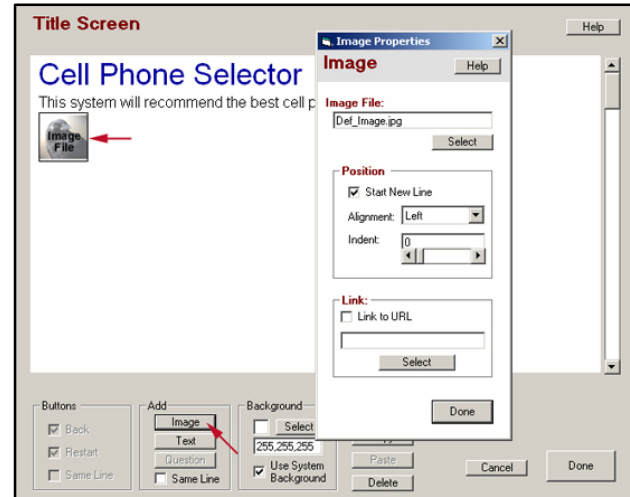
Click the "Done" button to close the Text window.



## Adding an Image

Now add an image to the Title Screen. In the "Add" box, click the "Image" button. This will add an image icon to the screen and open the window for setting the properties for the image. (The "Image File" icon is just a placeholder that is used until you select the image to use.)

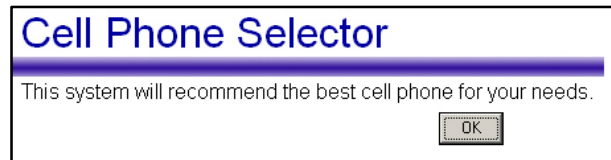
First select the image to actually use. Click the "Select" button to display the standard MS Windows file selection dialog. Select the file "line.jpg" in the Tutorial folder and click OK. The image selected will be displayed in the Title Screen window.



## Moving Items

The image that was just added is under the second line of text. It would look better to have it above this text. Moving items is very easy - just click and drag. To move the image up:

- Put the mouse cursor over the line image.
- Hold the left mouse button down.
- Drag the cursor to a point over the second line of text.
- Release the mouse button.



When any item is dragged and dropped on another item, it will be placed BEFORE that item. To move an item to the end, drag it to the end, just before the OK button. Items can be placed in any order and the Properties for the item can be used for "fine tuning". The Title Screen can be as complex as you wish, using many images and text items.

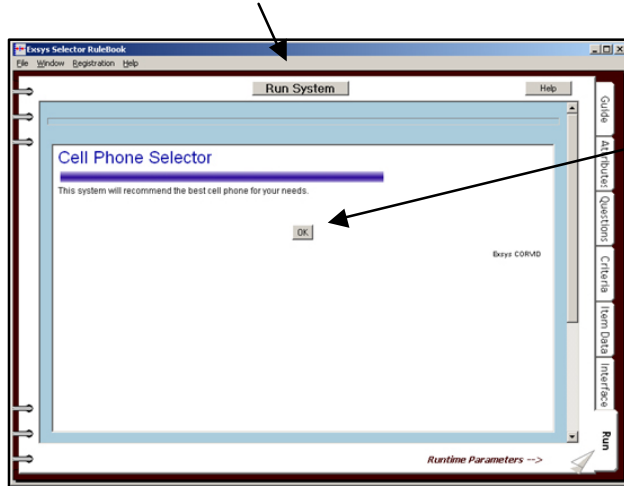
When the system is run, it will use a Java applet to draw the screen. Java is portable across platforms, but the details of the implementation on each machine, browser and environment vary. Because of this the exact display may look slightly different when the system is run from some browsers. When you run the system from the "Run" tab, Selector uses Microsoft Internet Explorer to display the files.

Java has built in support for relatively few fonts and will substitute the closest font it has, so the exact spacing and line breaks may look slightly different when running than in the editing window. Images always appear exactly the same on all browsers. If there is a problem with details of spacing, a jpg or gif that includes text can always be used.

## Running with the New Title

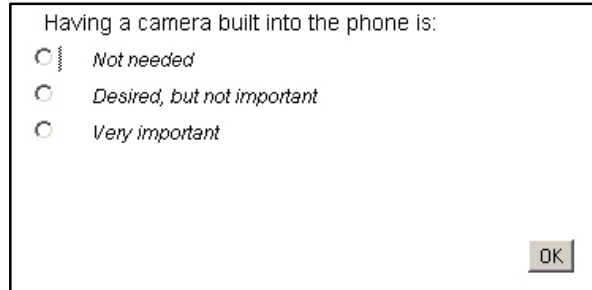
That is all that is needed for the title, so click the "Done" button on the title window screen.

This will return you to the Interface tab. Before designing the questions, run the system. Click the "Run" tab and then click the "Run System" button.



Since there is now a Title screen, it is automatically displayed at the start of the run.

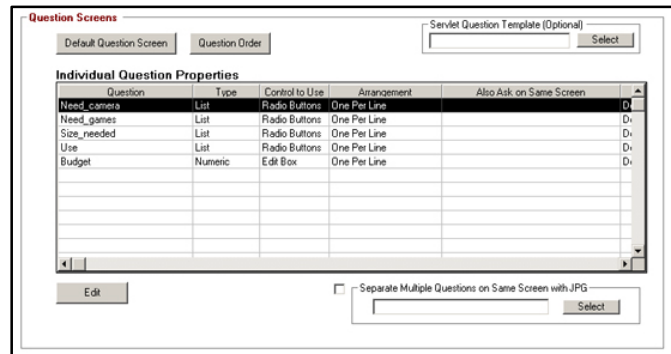
Clicking the "OK" button leads to the first question:



## Setting the Parameters for Questions

Rather than continuing with the system, you will now format how questions are asked. Click on the Interface tab. You will be using the middle section on Questions.

The overall format for questions is defined by a default format that applies to all questions, providing a consistent look and feel. Individual questions that require some special formatting can then be modified from the default. Also, multiple questions can be grouped on the same screen, each with their own formatting.

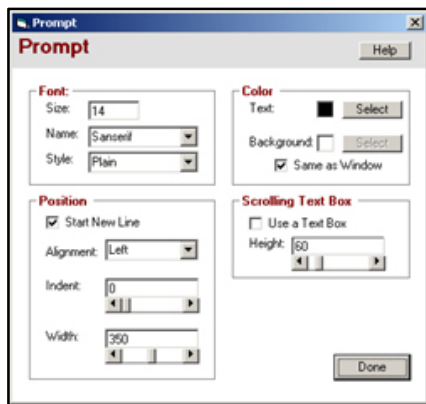
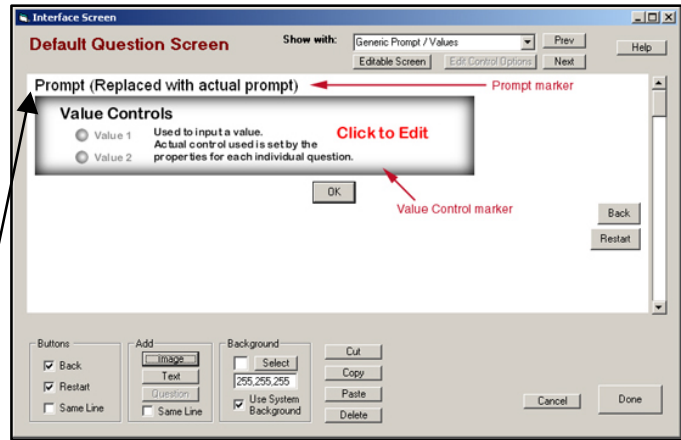


First, define the default Question format. Click on the "Default Question Screen" button at the top right of the "Question Screens" box.

This will display the same screen design window that was used for the Title, but this time it has 2 special "markers" in it.

The design of this window will be applied to all the questions in the system. Each question will replace the "Prompt" marker with the prompt text for that question. Likewise the "Value Control" marker will be replaced by the values and control for the questions. The properties for these markers will apply to each question.

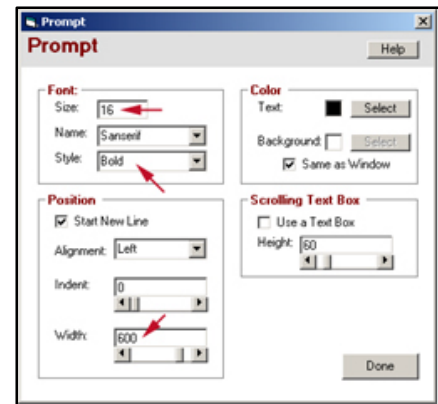
Click on the "Prompt (Replaced with actual prompt)" marker. A Prompt window is displayed for setting the properties for the Prompt text of each question.



In this case, set the prompt properties to:

- Font Size: 16
- Font Style: Bold
- Position Width: 600

Click the Done button to close the Prompt properties window.

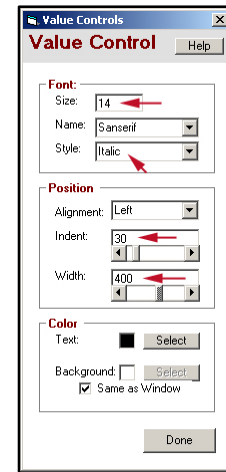


Click on the "Values Control" marker. This displays a similar window for setting the properties for the value text.

This time set the properties to:

- Font Size: 14
- Font Style: Italic
- Position Indent: 30
- Position Width: 400

These will be the properties for the values of each question.



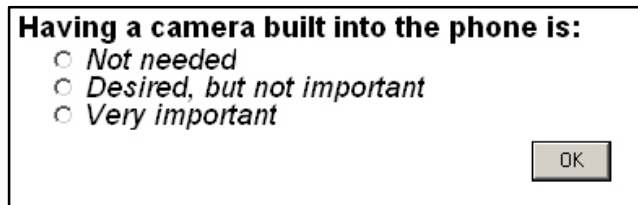
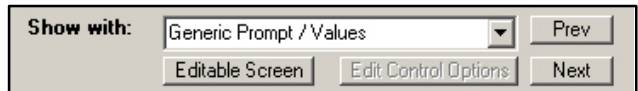
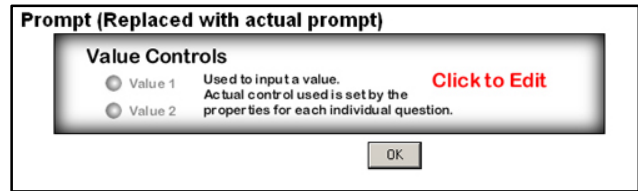
The default screen still shows the markers for prompt and values, though the prompt is now formatted according to the properties that were set, and the value marker is indented.

You can now look to see how each question will look when these generic properties are applied. To do this use the "Show With" options at the top of the window.

You can either select a specific question from the dropdown list, or use the "Prev" and "Next" buttons to step through each of the questions. Click the "Next" button and the first question is displayed with the new formatting.

Click the "Next" button a few times to look at some of the other question screens.

When a specific screen is displayed, you cannot perform some edits. To return to the main Default screen, click the "Editable Screen" button.

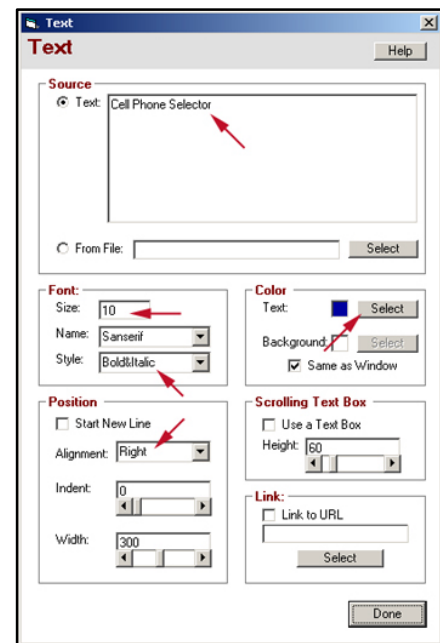


## Adding Text and Images to Question Screens

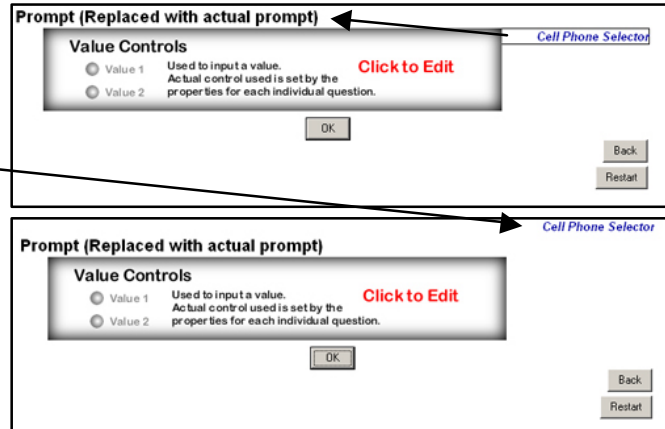
In addition to the markers on the Default Question screen, any other text or image can be added. This is done in the same way as when it was added to the Title screen. If you have not already done so, click the "Editable Screen" button to return to the default screen with the markers.

In the "Add" box at the bottom of the window, click the "Text" button. This will add a new text item that will appear on each Question screen. The window for setting the properties for the text will also be displayed. Set the properties to:

- Text: Cell Phone Selector
- Font Size: 10
- Font Style: Bold&Italic
- Position Alignment: Right
- Text Color: Click "Select" and choose a dark blue



That adds the text, but it is not in the correct location. Click down on the text item "Cell Phone Selector", drag it to over the "Prompt" marker and release the mouse button. It will now be at the top of the window on the right.



In addition to the items added to the actual question template, other text, images, links, etc., can be added to the HTML page that contains the applet. In many cases, this is a better place for titles and explanations that apply to the overall system, and it does not take up any of the space in the applet window.

When the system runs, it automatically generates an HTML page kb\_name.html (where kb\_name is the name of your system). This page includes the applet tag to include the applet in the window. This page can be edited with any standard HTML editor. Just make sure the applet tag section is not changed. All of the HTML code outside of the applet tag section can be changed to design the look and feel of a Web site.

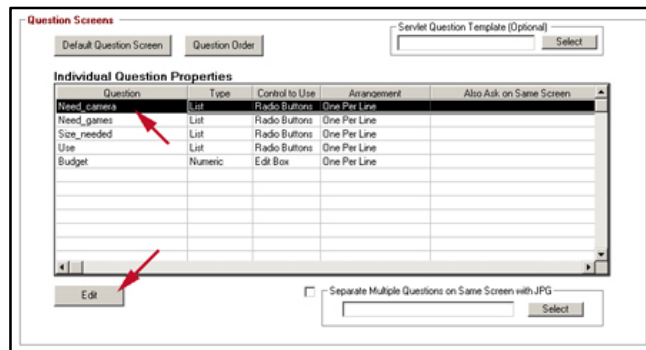
### Asking Multiple Questions on the Same Screen

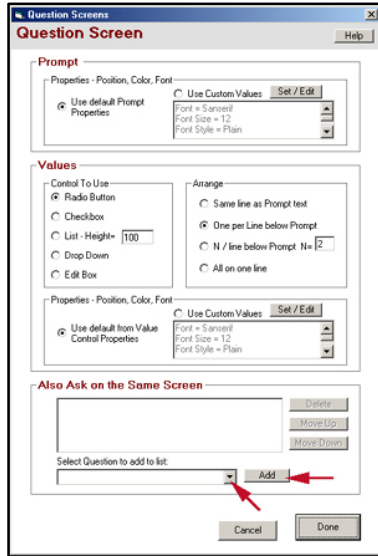
So far, when the system is run, each questions is asked one at a time. For many systems, it is better to ask several related questions on the same screen. This is very easy to do.

When the system runs, it first asks about the need for a camera and then about the need for games.

To ask these on the same screen:

1. Click on the Interface tab to select it
2. In the Questions section select the first question that is asked - in this case "Need Camera" and click the Edit button
3. This will display the window for setting the properties for that specific question. This window allows you to override the default question screen settings.



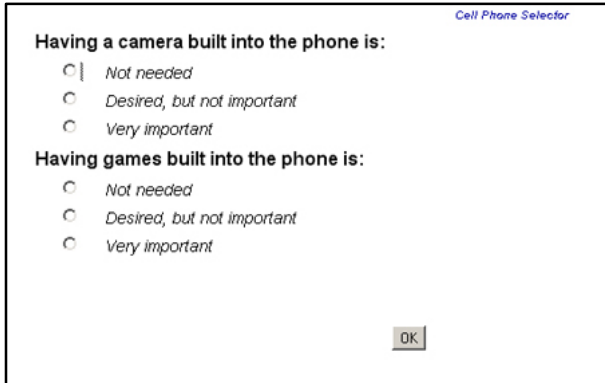


4. In the "Also Ask" section, click on the "Select Question to add to list" drop down list for other Questions, and select "Need\_games". Then click the "Add" button. This will add the "Need\_games" question to the Also Ask list for "Need\_camera".



5. Now when the "Need\_camera" question is asked, the "Need\_games" question will be asked on the same screen. This prevents repeat questions. If the "Need\_games" question has already been asked (due to other criteria, or other "Also Ask" lists) it will NOT be reasked.

Click the "Done" button to close the dialog.



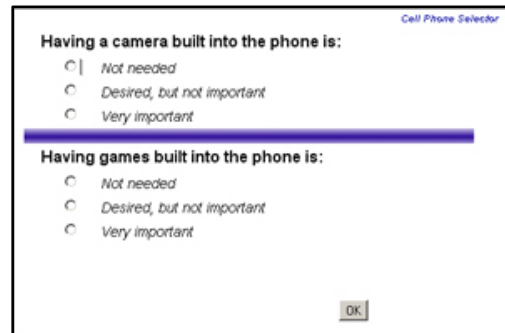
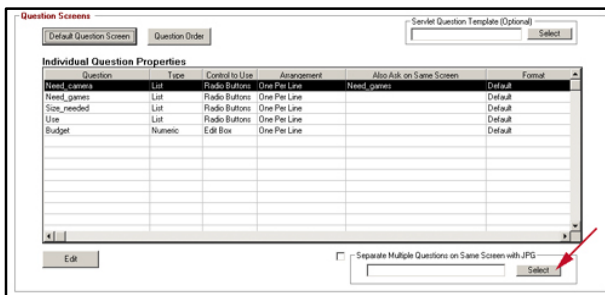
Now click on the Run tab, and click the "Run System" button. Click OK on the title screen and the first screen now asks both questions.

Now add a divider between the questions. A jpg or gif image can be inserted.

Click the Interface tab to select it. In the Questions section, click the "Select" button under "Separate Multiple Questions on Same Screen with JPG".

Select the file line.jpg that was also used on the title page.

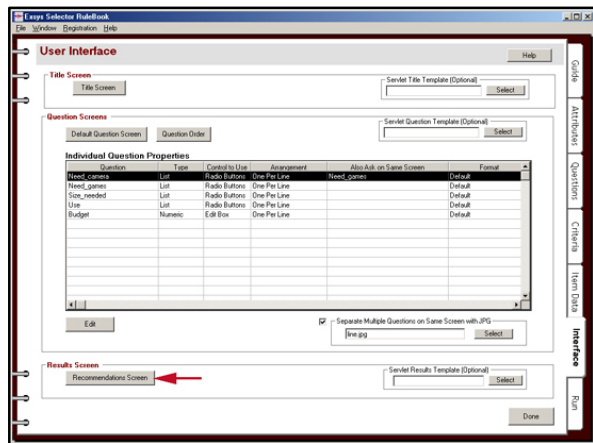
Now run the system again. This time the first questions screen will display:



## Formatting the Recommendations

There is only one step left to finish the system - formatting the recommendations. In the run so far, the final screen has been very simplistic:

Format the Recommendations screen by clicking on the Interface tab, and then clicking the "Recommendations Screen" button.



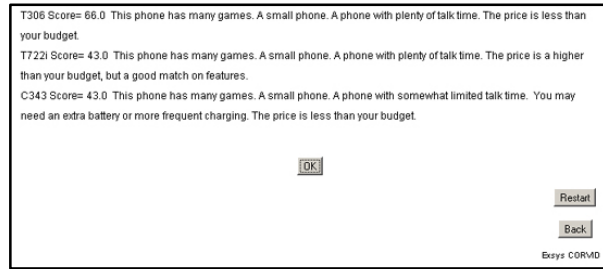
This window is similar to the Question template. The main image at the top is the Recommendations "Marker". This will be replaced by the actual system recommendations. Clicking on it allows setting the details of those recommendations. In addition, the "Add" controls can be used to add other text and images on the screen. These are used just as in the Title screen to add, format and move images or text. Also, "Add" now includes a "Question" button that makes it easy to display the customer's input with the results.

Click the "Text" button in the "Add" section and add the text "The cell phones I would recommend are:"

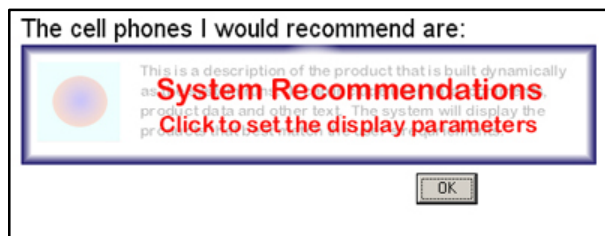
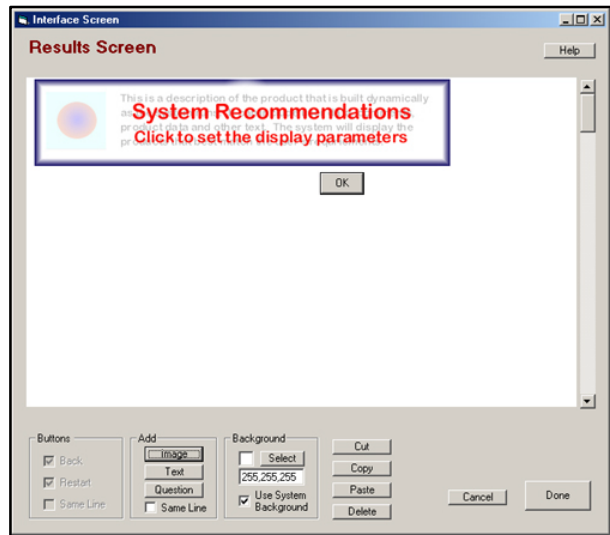
Format this to:

- Font size: 16
- Position Width: 500

Move the text to the top by dragging and dropping it on the "System Recommendations" marker. The screen should now look like:



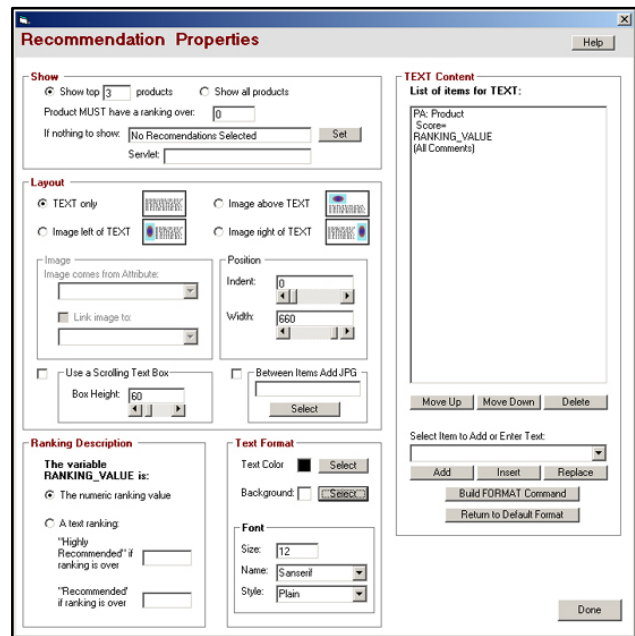
This will display the Recommendation widow in the screen editor.



Now click on the "System Recommendations" marker. This will display the Recommendations Properties window.

This window allows many properties to be set, but basically there are 3 main options for the recommendations:

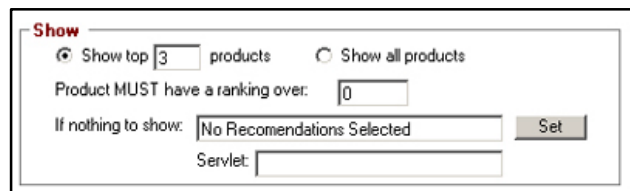
- How many recommendations to show.
- Will an image be included, and if so how will it be arranged relative to the text.
- What text will be included on each recommendation and how will it be formatted.



## Show Controls

The number of recommendations to show is set in the top "Show" control group.

By default, the system shows the top 3 recommendations. You can set this to a different number or select to show all products.



In either case, to be shown, the product must receive a score over a certain number of points. The default is "0".

Depending on the settings in the Criteria you may wish to change this to avoid recommending products that got lower scores. With the sample data that you ran with earlier, the top products received scores of 66 and 43. This should be checked by doing other runs, but it appears that a lower threshold of "25" would be reasonable, and a product that did not receive this many points should not be displayed. Change the "0" to "25".

When recommendations are displayed, the threshold value may limit the display to less than the "Show top" value. For example, if only 2 products received scores of over 25, only 2 would be displayed, even though it was specified to show the top 3.

The threshold can be set so high that it prevents any recommendations from being displayed. This is normally due to the customer asking for a particularly unrealistic combination of features. In that case, it is important to display something to tell the customer what happened and what to do. This is done with the "If nothing to show" option.



It allows specific text to be displayed in place of the "System Recommendations" marker if nothing meets the selection criteria. The default is the text "No Recommendations Selected". To change this, click the "Set" button.

Check that the properties are set to:

- Show the top 3 products
- Display threshold is 25
- The text when there is nothing to show is "Sorry, I could not find a cell phone close to what you asked for. You may have asked for too many advanced features at too low a price. Please try again. "

## Layout Controls

The next selection is to decide if an image will be displayed with the recommendations. This is done with the Layout control group.

Each recommendation will have some text. This could be as simple as just the name of the product, or a full report with all the detailed comments. The actual content of the "text" will be set in the next section, but the Layout box allows defining how the text will be displayed.

Often each product will have an image that will be displayed with the recommendation. If there is no image, then the layout options are limited. However, if there is an image, you must decide how the text will be placed relative to it. There are 3 options - left, right and above. In this case, click the "Image left of TEXT" option.

Since an image has been specified, you need to select where the image comes from. Since each product will have a different image file, this must be done generically using an "Image" Attribute. This Attribute will have created a column in the Product Data spreadsheet, and that column will have the name of the image for each product. Once you select a layout with an image, the "Image" control group will become active. The "Image comes from Attribute" dropdown list will display all the "Image" Attributes in the system. Most systems will have only one Image Attribute, but there can be more when needed. Select the Image Attribute "Picture".

There is also an option to associate a URL link with the picture, so that when it is displayed, a click on the image will link to a page with more information on that particular product. The link must be a String Attribute, with the actual link for each product a URL in the Product Data spreadsheet in that Attribute's column. To add the link, select a String Attribute from the "Link image to" dropdown list. The list will include all the String Attributes. In this case select the Attribute "Link". The "Link Image to" check box will automatically be checked.

With these settings, each recommendation will look something like:

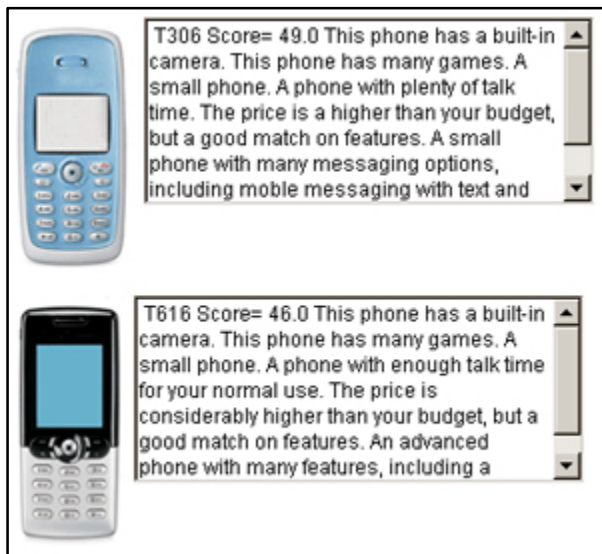
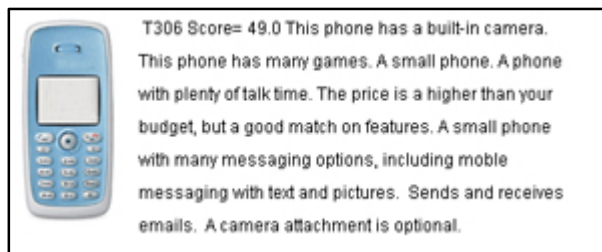
Clicking on the image will display the linked Web page with more details on the phone.

### Scrolling Text Boxes

The text can either be simply displayed as part of the recommendation screen, or can be put in it's own scrolling text box. Using a text box allows any amount of text to be included in a fixed part of the screen. If the text is too big for the text box, a scroll bar will automatically be added to it. For example, using a text box, the above recommendation might look like:

Each of the recommended phones has its own text box with specific content that applies to that phone. This is particularly good for situations where there may be very large amounts of text. The disadvantage of using a textbox is that all the text in the box must have the same font, size and color. If a textbox is not used, the text can mix fonts, sizes and colors.

**For this tutorial, select to NOT use a scrolling text box.** Instead you will set the color and format for individual parts of the text on each phone. A scrolling text box must have all the text in the same font and color.



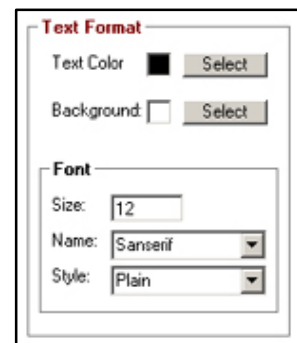
### The Recommendation Text

As shown above, each recommended product has an associated text description or report on that product. This report can contain a variety of information. Including the product Ranking, comments from Criteria, Attribute values, user input on Questions and other text.

The report can be formatted to control the font, size, and color of each item. The overall default format for the text is already set in the Text Format section of the window.

The values set here will be the ones used unless they are overridden by other format commands.

For this tutorial, leave the default format at 12, Sanserif, Plain.



The content of the report on each product is built in the Text Content section. This is a list of the items that will appear in the report.

The list can include:

- Any Attribute - the value for that specific product
- Any Question - the Customer's input value (the same for all products)
- The Comments from any or all Criteria
- Any other specified text string
- The Ranking value - the product's score
- A trace - used during development to show how the values were set
- A new line - used to format the text by starting a new line
- Format control strings - used to over ride the default format for text font, style and color

The starting letters of some items in the list indicate that they are Attributes, Comments or other special items. Items that start with PA are "Product Attributes". These are the values from the product data spreadsheet. The Attribute specifies the column to use. The value will be for the specific product row. The item "RANKING\_VALUE" is a special item that will be replaced by the ranking for that product. Likewise "(All Comments)" is a special item that will be replaced by the comments that were set in any Criteria. Items can also include other text strings that will be added to the report to provide labels.

The screenshot shows a window titled "TEXT Content" with a sub-header "List of items for TEXT:". Inside the window, there is a list of items: "PA: Product", "Score=", "RANKING\_VALUE", "(All Comments)", and "PA: Note". Below the list are three buttons: "Move Up", "Move Down", and "Delete". Underneath these buttons is a label "Select Item to Add or Enter Text:" followed by a dropdown menu. Below the dropdown are three buttons: "Add", "Insert", and "Replace". At the bottom of the window are two more buttons: "Build FORMAT Command" and "Return to Default Format".

The default report list shown above would produce a report that has the product name followed by the text "Score=" and the ranking value for that product. This would be followed by any comments that were set in the Criteria, and content of the "Note" Attribute from the Product Data spreadsheet for the specific product. Items are added to the report list by selecting them from the "Select Item to Add" dropdown list. The dropdown will show all the Attributes, Questions and Criteria along with the special options.

**Attributes:** All Attributes start with "PA" (Product Attribute). These will be the value for the Attribute for that specific product. This is the value in the Attribute's column in the Product Data spreadsheet for the specific product. This will typically be different for each product.

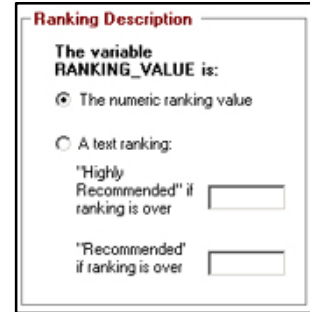
**Questions:** All Questions start with "UI" (User input). This will be the value provided by the Customer when they answered the questions asked by the system. This will be the same for each product in a single session.

**Comments:** All Comments from Criteria start with "CMT" (Comment). The comments can be included individually for specific Criteria, or the "All Comments" item can be selected which will include the comments from all the Criteria in the order that the Criteria were added to the system.

**Other Text:** Any other text string can be added by simply typing it into the edit box at the top of the dropdown list. This text will be added to the report.

There are also 3 special commands at the bottom of the dropdown list:

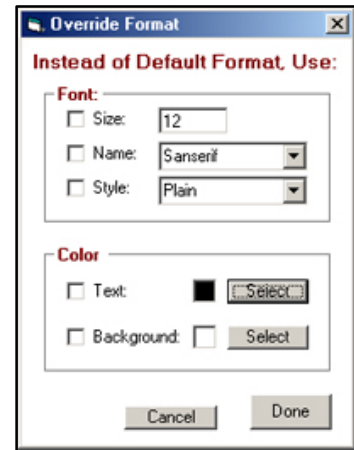
**Ranking Value:** This is the ranking that the product received. By default, this is just the numeric score for the product. This typically does not mean much to the end user, so it is normally only displayed during development to set appropriate thresholds and is later removed. The ranking can also be converted to the text string "Highly Recommended" or "Recommended" by using the Ranking Description box to set thresholds for the text rankings.



**Trace:** The trace is a detailed explanation of how the value and comments were set. This is very useful in development. If the system recommends a product that is unexpected based on the input, it indicates an error in the product data or the Criteria ranking levels. Adding TRACE will give you a detailed explanation of why the product was recommended. This will usually show where the problem is so it can be corrected. The trace should ALWAYS be removed before the system is released to customers since it will not make any sense to them.

**New Line:** This starts the next report item on a new line. It is used to format the text.

**Format Commands:** In addition to content, format commands can be added to the report. This is done by clicking the "Build Format Command" button. This will display a window for setting the new format.



Select the new format options and click the Done button. All subsequent items in the report will use this format until either:

- Another format command is added
- or
- The "Return to Default Format" button is clicked, which will return to the overall default format.

Adding a FORMAT command also starts a new line. Formats cannot be mixed on the same line. Unless extra space is intended, it is not necessary to add a "New\_line" command immediately after (or before) a FORMAT command.

### Adding Items to the Report List

Once an item is selected either from the dropdown, entering text or the FORMAT buttons, it is added to the report with the Add, Insert and Replace buttons.



- The Add button will add the item to the end of the report.
- The Insert button will add the item ABOVE the currently selected item in the list. If nothing is selected, it will add to the end of the list.
- The Replace button will replace the currently select item in the list with the new item.

Items can be moved in the list or deleted with the Move Up, Move Down and Delete buttons.



Click on an item to select it and then click the buttons to move or delete it. The report will have the items in the same order as the list.

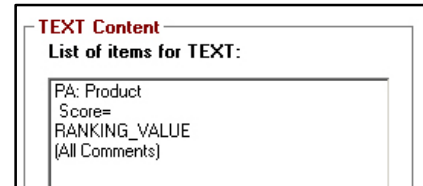
## Building The Report

Building the text of the actual report that will be displayed is simply a matter of making a list of the items you want.

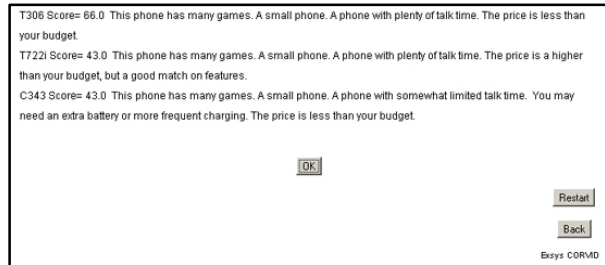
When a new system is started, the default report list is:

The text for each recommended product will be:

- The value of the Attribute "Product" (The product name)
- The text " Score="
- The RANKING\_VALUE (the point score that product received)
- Any comments that were set for the product in the Criteria



By itself, (without an image), this will produce a report that looks something like:



You have already improved this by selecting a layout and adding the image for each recommended phone, so it would now look like:

This helps, but it would look better to format the text.

To do this:

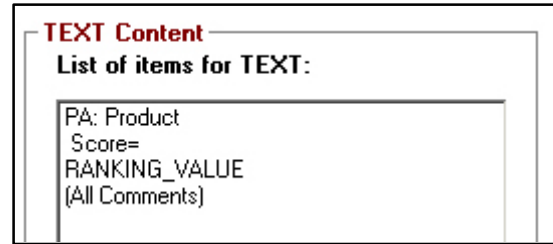
- Click on the Interface tab to select it
- Click the "Recommendations Screen" button to display the Recommendations window
- Click the "System Recommendations" marker to display the window for setting the options.



The list of items for the report should be:

This can be improved by formatting and more information.

First, delete the product score, since that will not mean much to the customer, and replace it with the price. Also, you should add the "Note" Attribute data since that will allow us to tell the customer any interesting facts about the phone. To do this:



- Click on "Score =" and click the Delete button
- Click on Ranking Value and click the Delete button
- Click on "(All comments)" to select it
- From the dropdown list, select "PA:Price" and click the Insert button

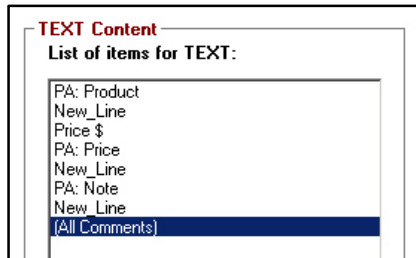
Put the price on a new line, preceded by "Price: \$"

- Click on "PA:Price" (which was just added to the list) to select it
- From the dropdown list, scroll down and select "New\_line" near the bottom of the list and click the Insert button
- Leaving "PA:Price" selected, click in the edit box at the top of the drop down list and enter "Price: \$". Click the Insert button

Now to add the "Note" Attribute.

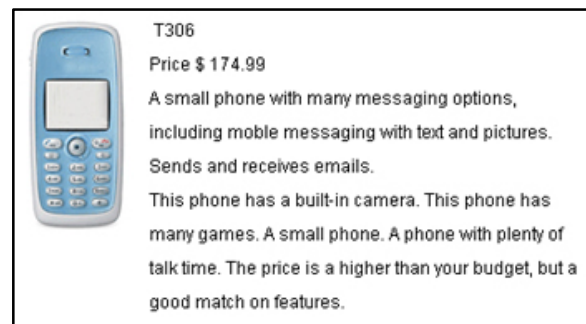
- Click on "(All comments)" to select it (leave this selected for the next steps)
- From the dropdown, select "New\_line" and click the Insert button
- From the dropdown, select "PA: Note" and click the Insert button
- Once again, from the dropdown, select "New\_line" and click the Insert button

The list should now look like:



If it does not, make any changes to make it match the above list.

Running the system with this report will produce:



That is getting better. Now to change the fonts and colors. Go back to the Interface tab and click the "Recommendations Screen" button. Then click the "System Recommendations" marker to again be able to edit the report list.

- Click on the top line "PA:Product" to select it.
- Click the "Build FORMAT command" button.
- In the format window, select a size of 16, style of Bold and a text color of dark blue, then click the "Done" button to close the format window.
- The FORMAT command will be displayed in the edit box at the top of the dropdown.
- Click the Insert button to add it to the top of the list

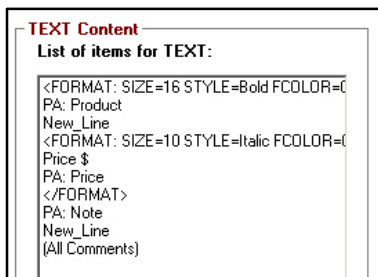
Now make the price smaller and italic.

- Click the line "Price: \$" to select it
- Click the "Build FORMAT command" button.
- In the format window, select a size of 10, style of Italic and a text color of dark green, then click the "Done" button to close the format window.
- The FORMAT command will be displayed in the edit box at the top of the dropdown.
- Click the Insert button to add it to the top of the list

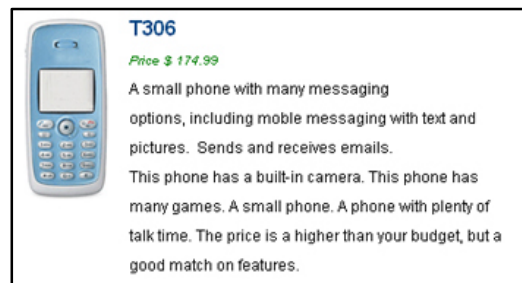
Now to display the rest of the text in the default font.

- Click on the "New\_line" commands UNDER "PA:Price" to select it
- Click the "Return to Default Format" button. This will add the "</FORMAT>" command to the edit window. This command returns the text to the format set in the "Text Format" box of the window.
- Click the **Replace** button to replace the "New\_line" command with the FORMAT command. This is appropriate since a FORMAT command always starts a new line.

The list should now look like:

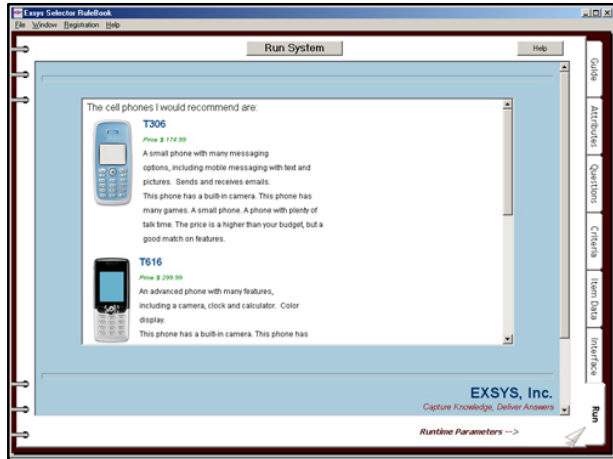


Running with this report list will produce recommendations that look like:



The full window at the end of a run looks like:

The phones are arranged in order, with the best first. Each phone has the comments from the Criteria that apply to that phone. The user can scroll through the phones to select the one they want. A click on the image will display the associated HTML page with more information on that phone. (In the tutorial these are just simple pages.)



## Putting an Image Between Products

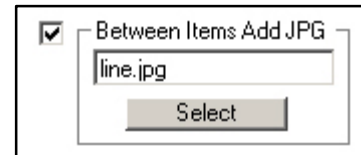
One further improvement would be to put an image between each of the products. This is easy to do:

- Click the Interface tab to select it
- Click the "Recommendations Screen" button
- Click the "System Recommendations" marker to display the Recommendations Properties window

In the Recommendation Properties window, in the "Layout" section, click the "Select" button under "Between Items Add JPG".

Select the image file line.jpg.

Click "Done" to close the properties window and Done again to close the screen designer. Now run the system again.



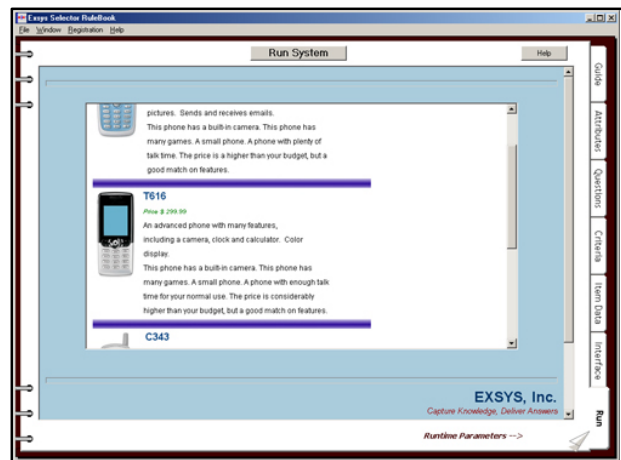
This time there will be the line image between each product.

## Enhancing and Maintaining the System

You now have a system that can effectively select and recommend cell phones based on the customer's needs.

This could be expanded with more Attributes and Criteria to include other factors in the decision. It could include links to ordering information, etc.

As new phones are released, or the specifications change, all that is required to update the system is to change the product data in the spreadsheet on the Item Data tab. Phones can be added, deleted or changed. As many phones as you wish can be included in the system.





The spreadsheet can also be exported to be edited with Excel or other spreadsheet program, and then imported into the Selector RuleBook - though for most changes, it is easier to make the changes in Selector itself. Each time the system is run, a data file with the latest data will be created.

## Moving the System to A Web Server

Now that the system is running, the next step is to put it on the Web so that everyone can get the benefit of the recommendations. This is very easy to do. Each time the system runs, all the files you need to move it to a Web server are generated. The main files are:

- An HTML page (kb\_name.html)
- The system logic files (kb\_name.cvr and kb\_name.cvr.u)
- The Exsys CORVID Applet Runtime Program that runs the system (ExsysCorvid.jar)
- The product data information (kb\_name.dat)
- In addition, any image files (jpg or gif), or linked HTML pages would also need to be moved.

If the system files are all in the same folder, all that needs to be done is to move these files to a Web server - just like any other Web page. Then just select the kb\_name.html page from your browser and the system will run.

The kb\_name.html page has the applet tag that runs the system, but all of the content around that tag can be changed to match the look and feel of a particular site.

The system can also be run using the CORVID Servlet Runtime. This is an optional program that allows running the system on the server via a Java servlet program, with the user interface handled through dynamically generated HTML pages based on templates. This provides a high degree of control over the system both in look-and-feel and advanced functionality.

## Building Your Own Selector System

You have now finished this tutorial and seen the steps used in building any Selector RuleBook system. You should be able to build your own Selector system to make other product selection decisions. Just follow the same steps as in the demo to add your Attributes, Questions, Criteria and product data.

If you are using the Evaluation version of Exsys Selector RuleBook, you will be limited in the number of Criteria that can be added to your system. If you have purchased Selector RuleBook and have received your activation code, you can build systems with any number of Criteria.

For more information on Exsys products and services contact:



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