Implementation Spotlight: ShowMeTheParts

Have you ever needed to find a part for your car like an oil filter, an air filter, or even a muffler? Well, we have an application that will help you find the automotive part you need. It is called "ShowMeTheParts" and it is the result of the collaboration between two organizations, Cycle Consulting, Inc. (http://www.cycleconsulting.com/) and Vertical Development, Inc. (http://www.verticaldev.com/). Cycle Consulting, Inc. are experts in custom software development specializing in database, Internet, Web, and browser based development using many of the leading edge tools available, most notably the Ext JS JavaScript framework. Vertical Development, Inc. are experts in handling automotive data, aggregating automotive part catalog data and disseminating it using custom database applications.

The "ShowMeTheParts" application is the culmination of an effort to provide access to various types of automotive part data via an easy to use interface in a browser based application. Its target audience is somewhat multi-faceted in that it can be used by automotive parts manufacturers, distributors, retailers, or even the casual user searching for a part for their own car. The goals that we set out for the application during its initial design were intelligence, ease of use, fast performance, remote configuration, and the ability to be branded using color, style, or theme modifications.

Why We Chose the Ext JS Framework

After reviewing the design, functionality, direction, documentation, and supporting user community of various JavaScript frameworks available for developing rich browser based applications, we settled on using the Ext JS framework. The overall design of the Ext JS framework using a component architecture as well as its very robust handling of data made it a perfect fit for the implementation we envisioned. In addition specific features like the very flexible and powerful grid and its associated components made the implementation of specific features of the application possible. In addition, the detail of the Ext JS API documentation and the availability of a very thorough list of samples and examples made choosing the Ext JS framework all the more apparent.

Basic Functionality and Usage

The basic function of the "ShowMeTheParts" application is to enable the user to search for one or more automotive parts using specific search criteria. The search criteria can be as simple as a part number or it can be a combination of items that the user would select from one or more drop down pick lists. The "ShowMeTheParts" application performs a search in an automotive parts catalog database and returns the results based on the search criteria and displays part information in a grid control.

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ShowMeTheParts   FOLLOW US ON twitter   f   How can it work for you? Watch!

Want us to show you even *more* parts? Register now for access to our full vehicle database!

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Year: 1998   Make: HONDA   Model: ACCORD   Product: BELTS, HOSES, TENSIONERS   Engine: V6 3.0L 2997cc

Supplier	Location	Brand	Part Number	Part Type	Qty	Comment	Applic
DAYC			231029	Drive Belt Idler Pulley	1	Grooved; Idler Pulley	LX
DAYC			231029	Drive Belt Idler Pulley	1	Grooved; Idler Pulley	EX
DAYC			231081	Drive Belt Idler Pulley	1	Idler Pulley; Smooth	LX
DAYC			231081	Drive Belt Idler Pulley	1	Idler Pulley; Smooth	EX
DAYC			231081	Belt Tensioner Pulley	1	Tensioner Pulley	EX
DAYC			231081	Belt Tensioner Pulley	1	Tensioner Pulley	LX
GATE		HEATER HOSE SHAPING COIL	28511	HVAC Heater Hose Shaping Coil	1	For 5/8 " I.D. Hose	GA
CQGT		HEATER HOSE SHAPING COIL	28511	HVAC Heater Hose Shaping Coil	1	For 5/8 " I.D. Hose	GA
DAYC			305256	Belt Tensioner Assembly	1	Automatic Belt Tensioner	LX
DAYC			305256	Belt Tensioner Assembly	1	Automatic Belt Tensioner	EX
FRSH			49001	A/C Drive Belt Idler Pulley	1	Tensioner Pulley	
GDYR			49001	A/C Drive Belt Idler Pulley	1	Tensioner Pulley	
FRSH		POLY-V	49248	Belt Tensioner Assembly	1		
GDYR		POLY-V	49248	Belt Tensioner Assembly	1		
GDYR		MOLDED	63806	Engine Coolant By-Pass Hose	1	Heater to Valve; Cut to Fit	
GDYR		MOLDED	63824	Engine Coolant By-Pass Hose	1	Valve to Engine; Cut to Fit	
GDYR		MOLDED	63924	Engine Coolant By-Pass Hose	1	Heater to Engine; Cut to Fit	
GDYR	ACCESSORY DRIVE		K49248A	Serpentine Belt Drive Component Kit	1	Alt & AC; Kit Includes Alt & AC Poly-V Belt and Tensioner Assembly	
GDYR	ACCESSORY DRIVE		SBHA050001	Accessory Drive Belt	1	Routing Diagram	
CRP	AIR CONDITIONING AND ALTERNATOR		PK060461	Accessory Drive Belt	1		

Search results based on an Application (Year, Make, Model, Product, and Engine) search

In order to meet the original requirements of intelligence, ease of use, and fast performance, the "ShowMeTheParts" application has several convenience features that enable the user to perform searches and narrow their results in order to help them find the part or parts for which they are searching. For instance, all of the drop down pick lists for a specific type of search will respond intelligently to the user selecting values so that the user can perform a search as fast as possible. After an item in a preceding drop down pick list in a series is selected, the next drop down pick list in the series will be expanded so that the user has a view of the items that it contains. If a drop down pick list contains only one item to select, that item will be selected automatically and focus will be transferred to the next drop down pick list in the series. This intelligent behavior is a result of the capabilities of the components in the Ext JS framework and their very robust event model and can result in the user being able to perform complex searches with a minimum of effort since the "ShowMeTheParts" application "understands" the data in the part catalog database.

In addition to the smart searching capability, the "ShowMeTheParts" application also provides some very powerful tools to enable the user to drill down into the resulting data for a particular search using a filter condition. The filter condition is implemented so that it is based on the data that the user retrieved from the part catalog database.
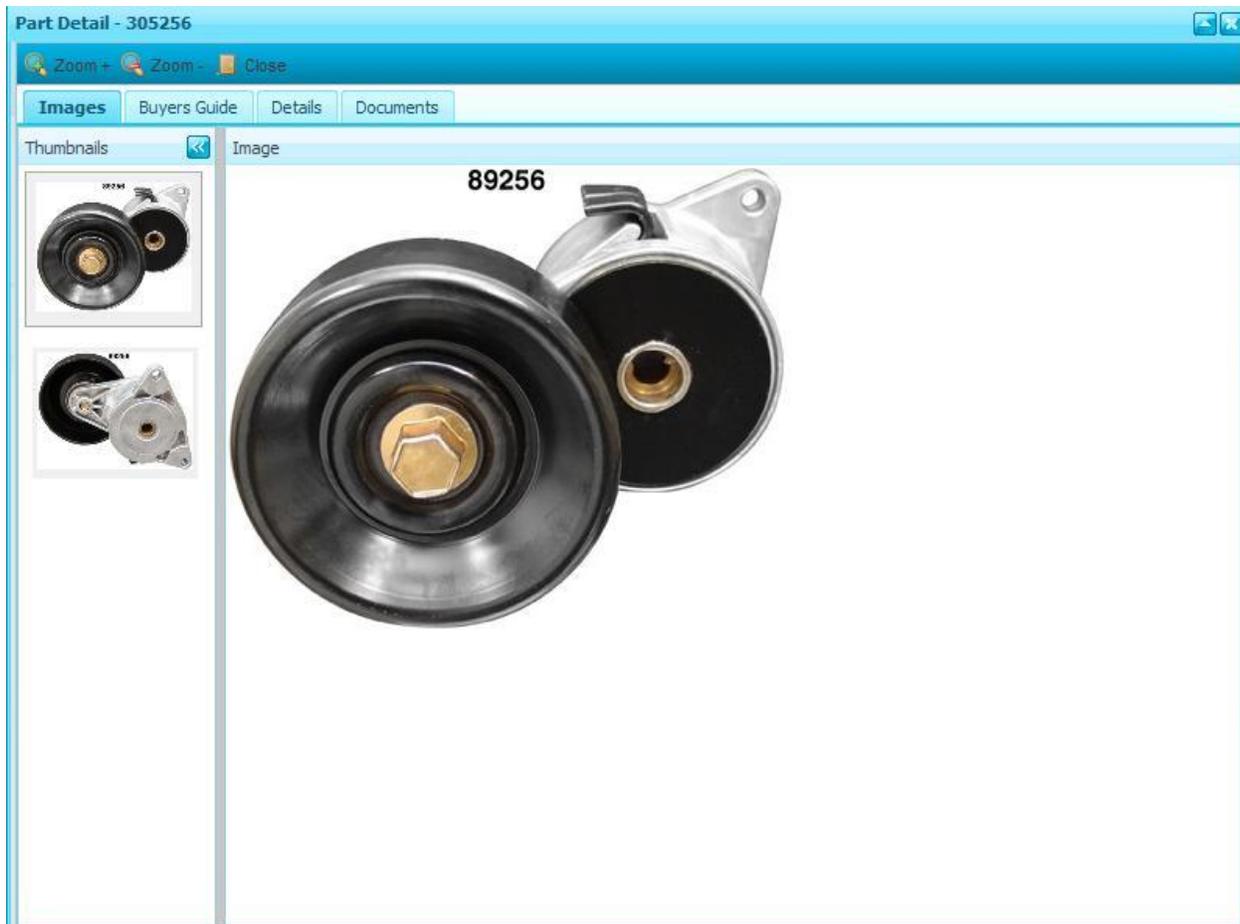
Filter menu based on the current search results

The users can filter their search results by using a new dynamic filter menu that is attached to the grid column header context menu. The filter menu enables the user to select values for the filter condition from the menu and "Activate", "Deactivate", or "Refresh" the filter condition. The values for the filter condition in the menu are retrieved from the search results so the user can easily specify a valid filter condition. In addition, the columns in the grid that support filtering are identified with a small magnifying glass icon just to the right of the column header caption. In keeping with the theme of making the "ShowMeTheParts" application as smart as possible, the user is also able to click on the magnifying glass icon to display the filter menu thus avoiding the need to pull down the column header context menu to create a filter condition. To implement this functionality, we had to extend the behavior of the stock Ext JS grid component so that it could provide these features to the user. The excellent documentation of the grid component as well as its robust design made this possible.

After the user has found a part that matches their search criteria, they can display the detail information about the part, which may include one or more images of the part.

Part detail dialog with images of the part and detail information about the part.

The images can be navigated using the thumbnails on the left side of the dialog and zoomed larger or smaller to view the part in greater or lesser detail respectively. This capability is a result of using the very powerful template and data view classes in the Ext JS framework.

Configuration and Custom Branding

One of the primary design considerations for the "ShowMeTheParts" application was the ability to configure and deploy it to meet a specific implementation requirement without having to alter its source code. In addition, we wanted to insure that this sort of flexibility would result in little or no impact on the performance of the application. The final solution to this requirement involved creating a way for the application to be deployed with a set of configuration settings that it would retrieve at runtime and employ to alter its features, functionality, and behavior. When the person handling the application deployment creates the site on the Web server, they use a configuration utility to adjust the settings for the application. The configuration settings are then saved to persistent storage on the Web server so that the "ShowMeTheParts" application can retrieve them and dynamically configure its features, functionality, and behavior. As a result, the end user sees the functionality and data in the application that is tailored specifically to their needs.

Search results based on an Exhaust (Year, Make, Model, Engine, and Qualifier) search

In addition to the "ShowMeTheParts" application being configurable, it was also required that it be able to support having its colors and styles be easily modifiable so that if a particular automotive part manufacturer, distributor, or retailer wanted to have it use their corporate color scheme or logo, it could accommodate this. This is an area where the Ext JS framework afforded us an opportunity to handle this requirement by using a custom theme to match the "branding" for a particular implementation. In addition, the recent separation of the style sheets in version 3.0 of the Ext JS framework into visual and structural elements has made the "branding" of custom implementations even simpler. Currently there are nearly one hundred (100) custom implementations of the "ShowMeTheParts" application based on the same application source code but using a different set of configuration settings and a different branded theme. Below is a sampling of the specific implementations:

- http://www.showmetheparts.com/airtex/
- http://www.showmetheparts.com/apexhaust
- http://www.showmetheparts.com/luberfiner/
- http://www.valvolinefilters.com/

A more extensive list (http://www.showmetheparts.com/Html/News.html) is available on the Vertical Development, Inc. Website. Each of these implementations demonstrates some specifics of the functionality in the application and we are able to update the application behavior as required using the configuration setting utility without adversely impacting the current users.

Shopping Cart and Third Party Shopping Cart Integration

As the usage and the user community of the "ShowMeTheParts" application has evolved, we have continued to add new functionality to the application. For instance, the first version enabled the user to search for an automotive part or set of parts, however, if they wanted to make a purchase, they would have to use the associated e-commerce site of a part manufacturer or retailer to perform the actual purchase the part or set of parts. Adding shopping cart functionality to the "ShowMeTheParts"

application soon became a priority as more users and vendors voiced a desire to be able to handle this process from within the application.

		Supplier	Part Number	Part Type	Qty	Price	Description
⊞	☐	Gates	38001	Belt Tensioner Pulley	1	19.11	ALTERNATOR AND AIR CONDITIONING BELT DRIVE PULLEY GAS
⊞	☐	Gates	38169	Belt Tensioner Assembly	1	69.87	ALTERNATOR AND AIR CONDITIONING BELT DRIVE TENSIONER GAS
⊞	☐	Gates	K060461	Serpentine Belt	1	10.65	ALTERNATOR AND AIR CONDITIONING AUTOMOTIVE V-RIBBED BELT (STANDARD) GAS
⊞	☐	Gates	19699	HVAC Heater Hose	1	6.31	HEATER TO THERMOSTAT MOLDED HEATER HOSE GAS
⊞	☐	Gates	28411	HVAC Heater Hose	1	0.71	HEATER TO VALVE-1 STRAIGHT HEATER HOSE (STANDARD) Cut to Length, 6 " GAS

Internal application shopping cart populated with parts to purchase.

Since many manufacturers and retailers already provided the ability to purchase automotive parts from their own Websites, we decided that rather than simply construct a custom shopping cart implementation, we should create a system where the "ShowMeTheParts" application could integrate with any existing custom or third party shopping cart as well. Since we had created a very efficient system for the configuration of the application, we decided to extend the configuration settings functionality to enable the dynamic configuration of the shopping cart functionality to handle the custom and third party shopping cart integration requirement. This has enabled us to integrate the "ShowMeTheParts" application shopping cart with various external shopping cart implementations resulting in very robust handling of e-commerce transactions.

Google Maps and "Where To Buy" Functionality

Although the "ShowMeTheParts" application provides the user the ability to purchase automotive parts directly from a manufacturer or a retailer using its internal shopping cart implementation and its external shopping cart integration, there are users who may need to acquire a part from a local vendor. In order to fulfill this requirement, we chose to integrate Google Maps into the "ShowMeTheParts" application so that the user can retrieve the location and contact information for a vendor in their area.

Purchase locations of local retailers who sell the specified part.

In most cases, the list of local vendors will be displayed to the user on the Google Map with their associated detail information displayed in the grid below the map. In the cases where actual street address information is not available for the vendor, their information will appear only within the grid. This enables the user to find vendors that sell the part that may be available on the Web but that do not have an actual physical location to visit.

Final Thoughts

The "ShowMeTheParts" application has seen greatly increasing usage as users have become acquainted with it. Last month alone, we experienced over 500,000 unique visits and over 1.5 million queries of the database. If you would like to give it a try, it is currently free for use. Without providing registration information, you can perform searches for parts from the year 1996 through the year 2000. If you would like to perform more extensive searches, you can provide registration information (email address and password) which will enable you to login to the application to access its full functionality.