



Your Online Junkyard Retailer

Final Report

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1 - Introduction

PartsHound is a user-friendly, online used automotive parts resource database inventorying a warehouse of vehicle parts available for searching and purchasing, to registered customers via the Internet.

This final report outlines the completed product in detail, including external user and administrative interface use instructions, system design, and system file specifics.

1.1 - Purpose of Document

The Client, investors, developers and administrators of the PartsHound system should employ this document as a guide for system use, and to ensure that the final product does indeed meet initial specification requirements. This document also provides a blueprint for future system extensions and maintenance. Communication between all interested parties at this stage should be geared towards the fine tuning of the system and maintenance details with regards to the functionality and potential improvement of the database, sites, total aesthetics, and user-friendliness.

1.2 - Document Scope

This document divides the Parts Hound system implementation and design, with the following sections:

- An executive summary, highlighting the major system features.
- Site functionality walk-through for external user (consumer) and administrative navigation of the system.
- Entity relationship design, representing essential system components.
- Detailed implementation outline featuring file descriptions and functions.

1.3 - Mission Statement

The developers of Parts Hound envisioned the final product to fulfill the following purpose:

“To provide consumers with a large, geographically non-specific search engine to a database of quality used motorcycle and automotive parts available for purchase, to be shipped anywhere.”



2 - Executive Summary

The Parts Hound system provides a solution to the distribution of used automotive and motorcycle parts, inventorying and displaying, through a simple online user interface, the existing stock of geographically non-specific parts available for continued use, for purchase at competitive rates. This process is completed with the development of a robust database of parts, with the cooperation of existing “junk-yards”.

Benefits to society with this system include the benefit of users, via savings and sourcing of discontinued items; joint profit of invested Parts Hound parties and junk-yards, and not less importantly the environment; by re-using parts, as opposed to putting them in landfills, or using unneeded resources, to melt parts down in order to manufacture new parts.

Parts Hound is comprised of two separate interfaces, to facilitate successful operations: a user (customer) interface, and an administrative interface, both interacting with the parts database through web sites.

The user interface opens with the Parts Hound main page, introducing the consumer to the basic functionality of the site. Access to the database is granted through the “Search Parts” menu section, allowing guests to freely browse the Parts Hound database for parts, by search criteria of make, model, year, and part description; none of which are required fields in order to perform a search. If the customer cannot find his or her part of choice, the option to request a part is made available, and the user may send an e-mail to Parts Hound staff describing the part. PartsHound staff can attempt to source the part and inform the user if found, and or add this stock to the database.

If the user finds parts within the search, the part can be added to their shopping cart, and the user may continue browsing. At the point when the user wishes to purchase a part, he or she must log in to the system, or create a new account if not already registered, in order to complete the transaction. After logging in, the user must proceed to the cart checkout, which leads them to the Pay-Pal online payment system, and completes the transaction. Administration is notified of the transaction, the database is updated to set the item as *sold*, and the part is arranged to be shipped to the consumer at their specified address.

The administrative user interface is accessed with an authorized log-in. Once granted access, the administrators are able to view and delete customer information, perform a search on shipment information by shipment number, date, status, and customer name, where search results will lead them to specific shipment invoices, with shipping details, that the administrator can view. An inventory management section allows administrator to update, add and delete database items directly. Administration management allows the administrator to add, update and delete administrator information.



2.1 - Internal System Requirements

This section provides a description and status of the predominant site features for the consumer website.

ID	Description	Comments
ISR1	Selection of DBMS	100% complete. MySQL chosen.
ISR2	DDL Script	100% complete.
ISR3	Development Environment	100% JSP technology chosen.

2.2 – External User

This section provides a description and status of the main site features for the administrative website.

ID	Description	Comments
EUR1	Customer authentication system with hashed passwords.	100% complete
EUR2	Existing customer sign in page.	100% complete.
EUR3	New customer registration system.	100% complete.
EUR4	Product search tool.	100% complete.
EUR5	Customer contact form.	100% complete.
EUR6	View shopping cart items.	100% complete.
EUR7	Customer checkout.	100% complete.
EUR8	Customer special requests.	100% complete.



2.3 – Company Administrator Requirements

ID	Description	Comments
CAR1	Administrator authentication system with hashed passwords.	100% complete.
CAR2	Administrator login screen.	100% complete.
CAR3	Administrator inventory management.	100% complete.
CAR4	Administrator sales management.	100% complete.
CAR5	Administrator customer management.	100% complete.
CAR6	Administrator shipment management.	100% complete.
CAR7	Administrator central user interface.	100% complete.

2.4 – Future System Enhancements

ID	Description	Comments
FSE1	Product thumbnail and enlarged photos.	100% complete.
FSE2	Product “compatibility” feature to allow users to find compatible parts.	100% complete.
FSE3	AJAX powered interfaces	0% complete.
FSE4	Password retrieval system.	0% complete.
FSE5	PayPal payment integration.	100% complete. Ability to go “live” with real-world payment processing is also 100% complete.



3.0 - User Walkthrough

For testing purposes, PartsHound utilizes the PayPal Sandbox to simulate real world transactions. You must log into the PayPal Developer Sandbox prior to purchasing items in your shopping cart. This ensures that real credit cards and/or PayPal funds are not transferred while testing the PartsHound website.

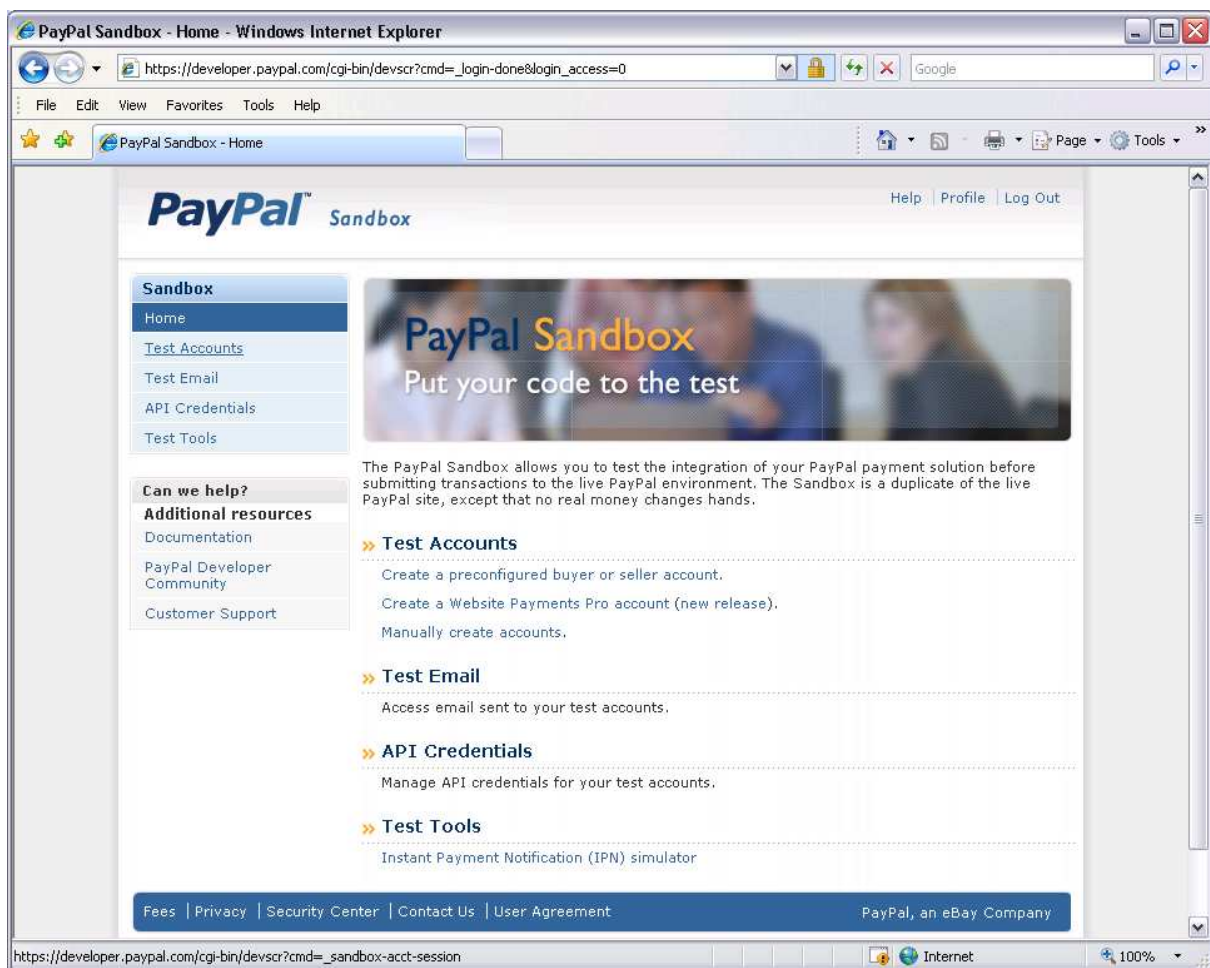
3.1 –PayPal Developer Sandbox.

Navigate your web browser to the PayPal Developer Sandbox at <https://developer.paypal.com/>. To log in, use the following credentials:

Email Address: dev.drop@yahoo.com

Password: partshound

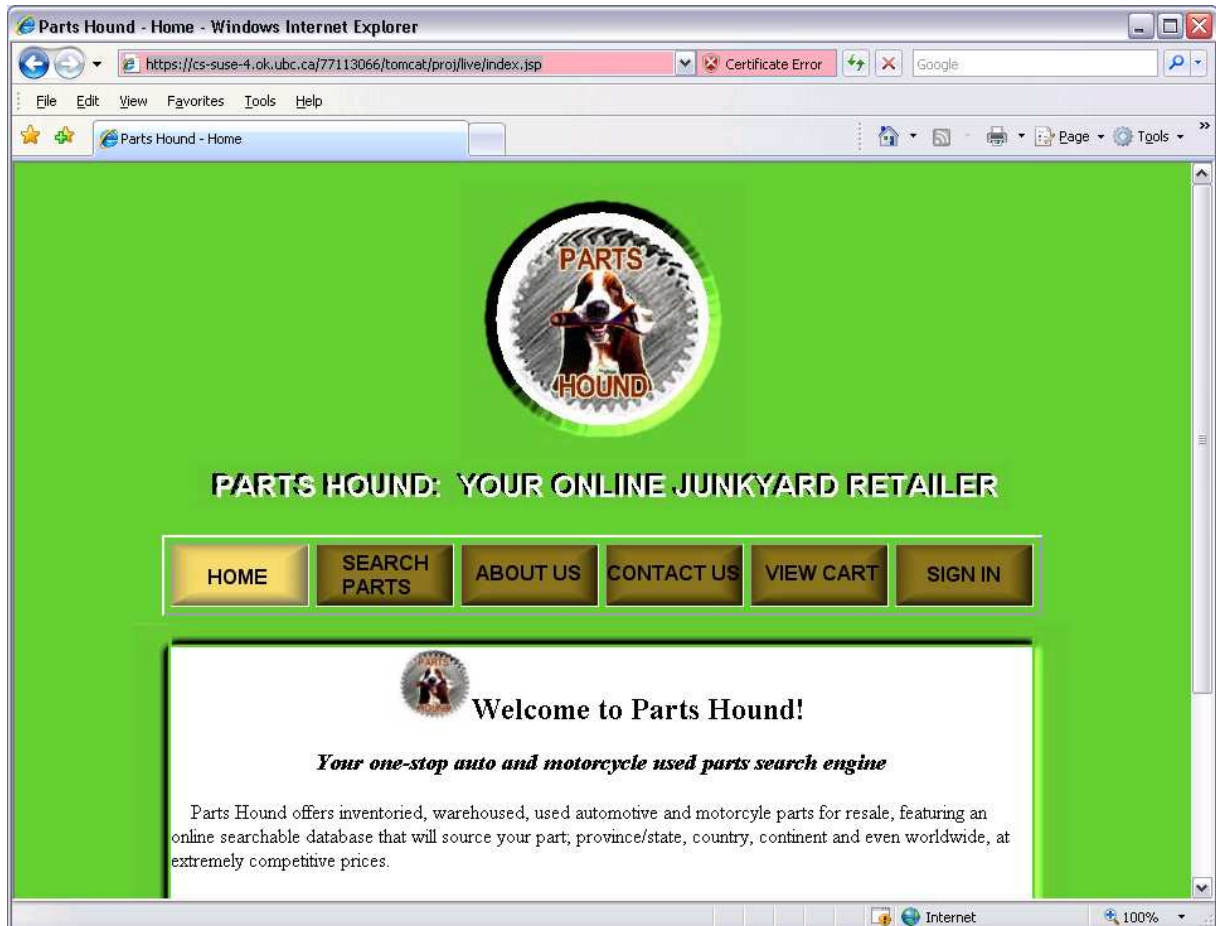
Once you've successfully logged in, you will be presented with the following screen. You may now minimize this window and begin your shopping experience with PartsHound.





3.2 – Beginning Your PartsHound Experience

Experiencing PartsHound begins by opening a new browser window and navigating to the PartsHound website, <https://cs-suse-4.ok.ubc.ca/77113066/tomcat/proj/live/index.jsp>.

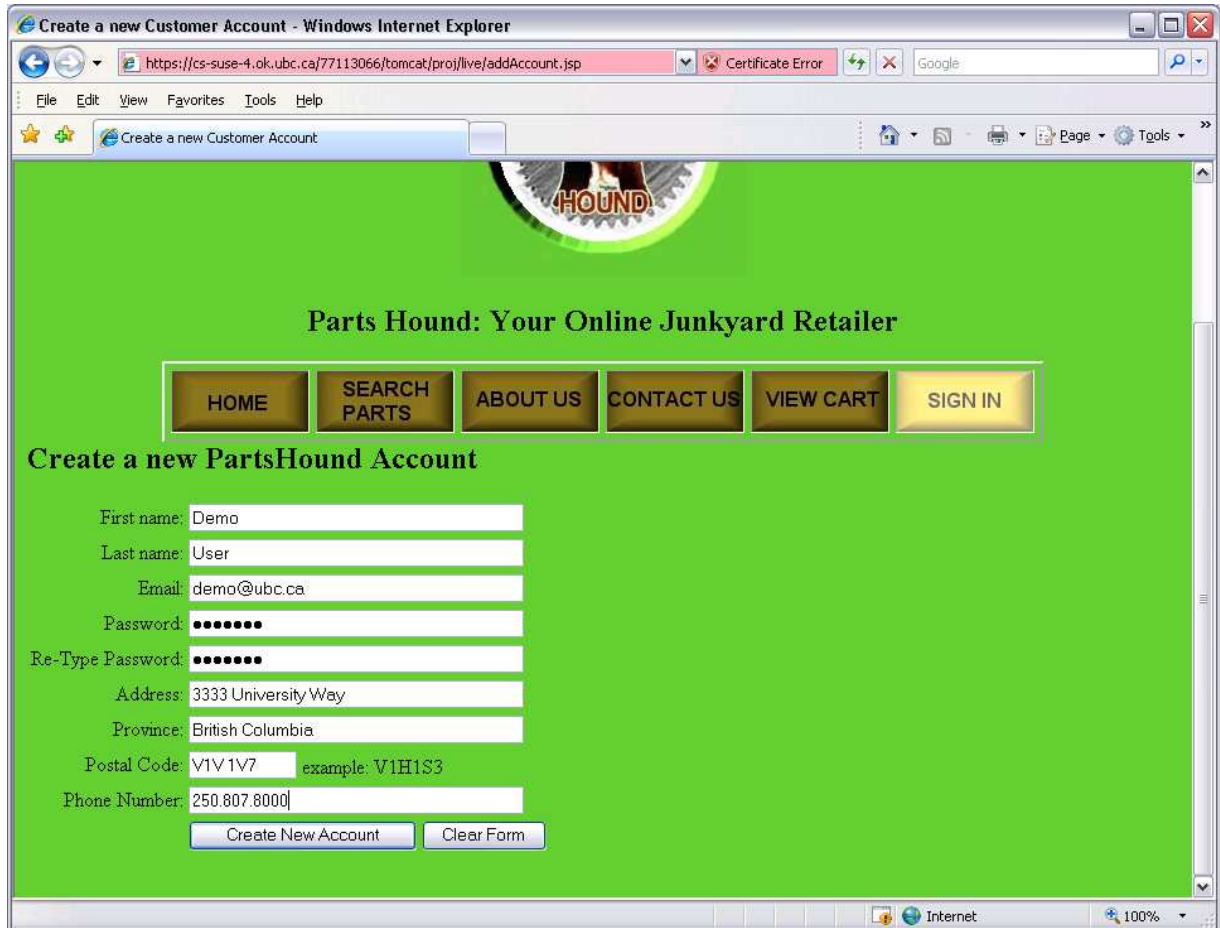


From the central menu, you can select the basic components of PartsHound. We'll start by creating a new user account.



3.3 – Creating a New User Account

Select Sign-In from the central menu and click on the *create a new account* link.



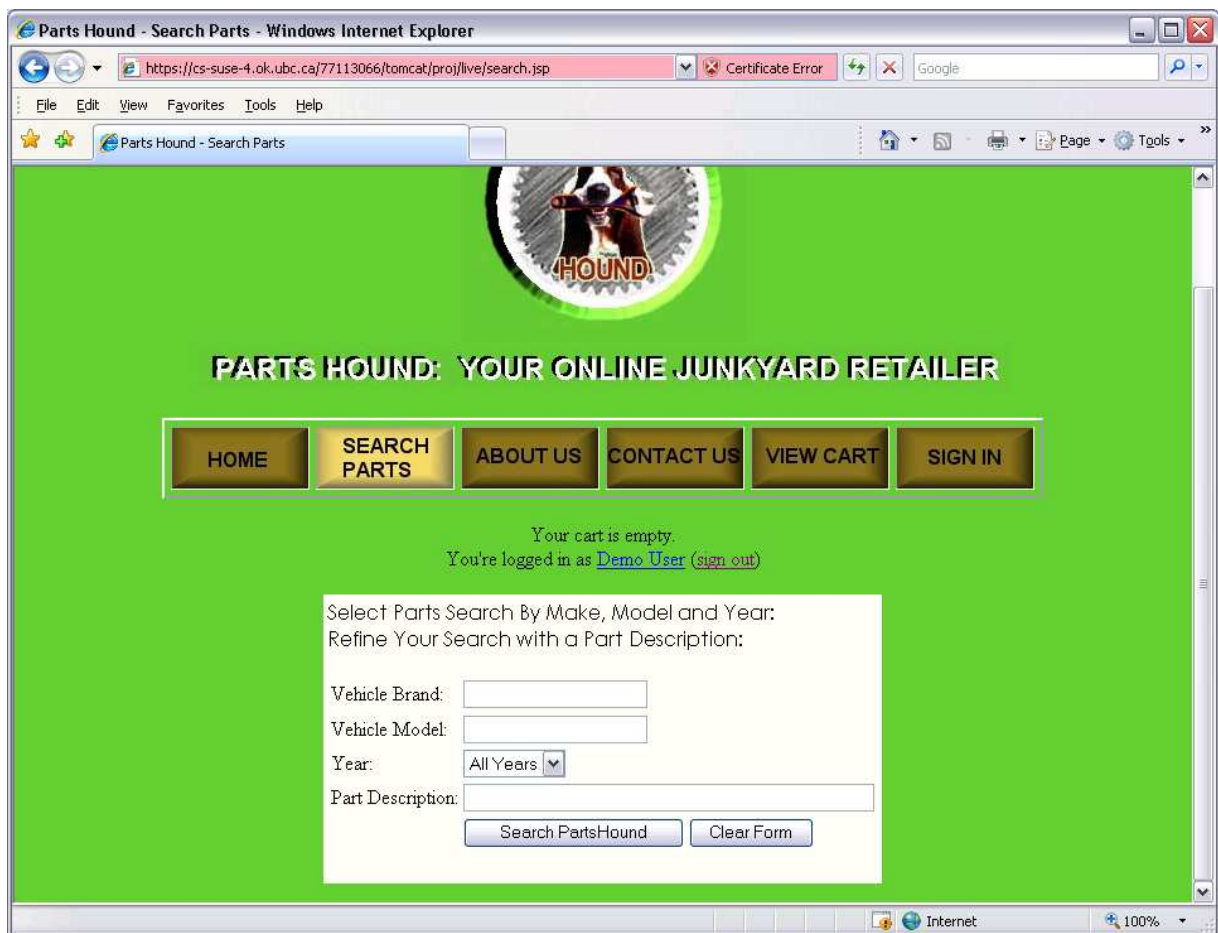
Fill in the required information and press the *Create New Account* button. If you've missed any fields, a pop-up dialog will indicate what fields you've missed. Once you've successfully created your account, you will be presented with a small status message indicating that your account has been added and that you are now logged in.



3.4 – Searching for a Part

The PartsHound website contains a small demonstration inventory which allows you to search for commonly requested parts. While the inventory within the delivered software is small, it should be sufficient to demonstrate the full search capability.

Navigate to the Search Parts page via the central menu. From this page, you can perform search the PartsHound inventory a variety of ways. For a global inventory search, simply leave all fields blank and ensure the year field is set to *All Years*.



Let's assume you own a 2001 Honda Civic. You can view all the parts that fit your vehicle by entering *civic* in the *Vehicle Model* field and selecting *2001* for the year. Click the Search PartsHound button to retrieve a list of compatible parts.

The search results will display all parts within the inventory which fit your 2001 Honda Civic. Notice that there is a bolt from a 1951 Ford F150. PartsHound is telling you that this bolt is 100% compatible with your 2001 Honda Civic.

PartsHound contains a special relation within the database that tracks parts compatibility. This feature separates PartsHound from other online parts retailers.



Within the search results, you will notice that the right-most column contains a link to add each item to your shopping cart. Again, notice that if an item has a zero stock quantity, the *add to cart* link is replaced with an *out of stock* tag.

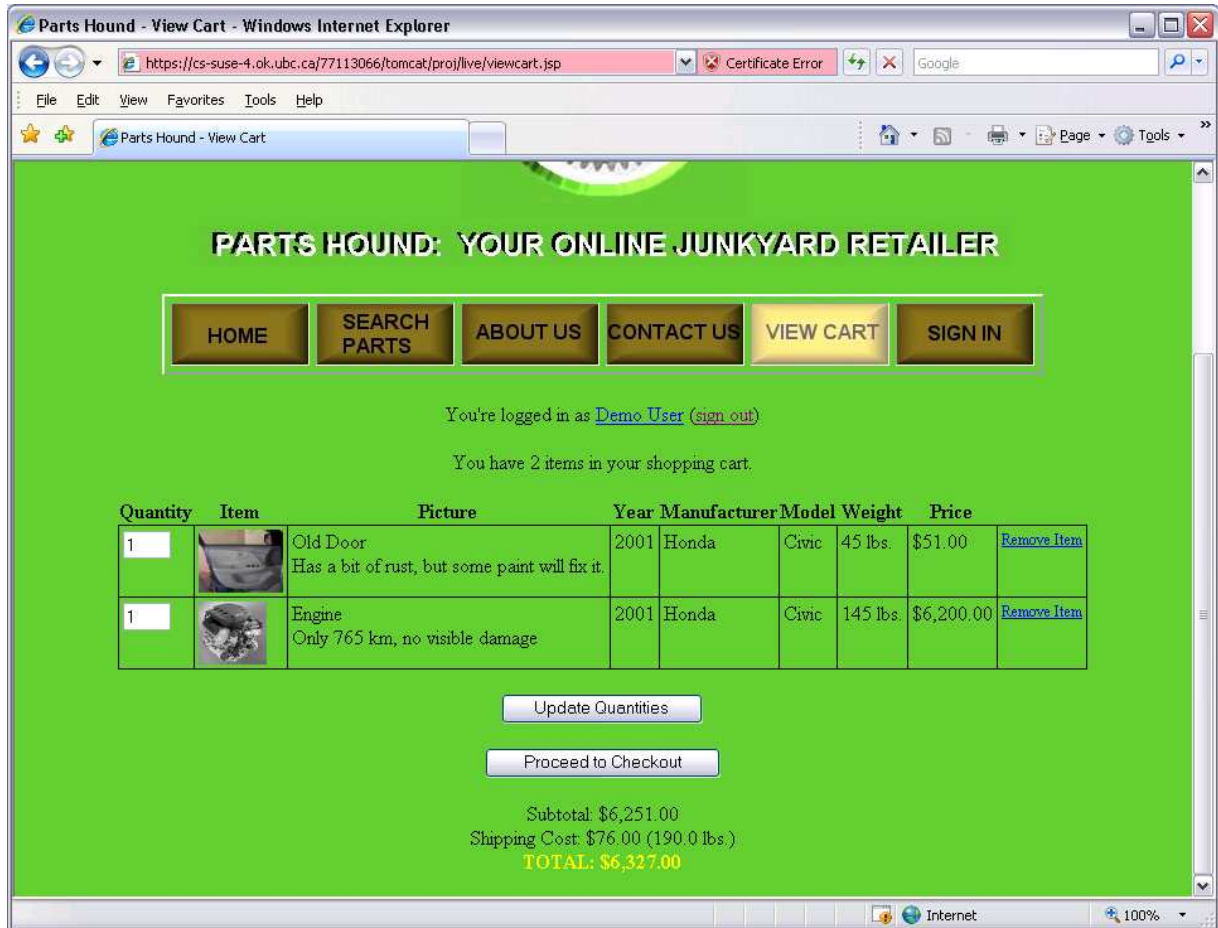
Suppose our 2001 Honda Civic needed a new door and a new engine. Find those two items within the search results and add them to your shopping cart. Take note of the existing stock quantities while you add them to your cart. Notice they don't decrement since you haven't actually purchased the items – you've simply added them to your shopping cart.

Each time you add an item to your cart, you'll see your cart's item count increment by one and a blue status message indicating the item has been added.



3.5 – Your Shopping Cart

Let’s explore your shopping cart now that you have added items to it. The shopping cart shows you the items you wish to purchase. Click on the View Cart button from the central menu.



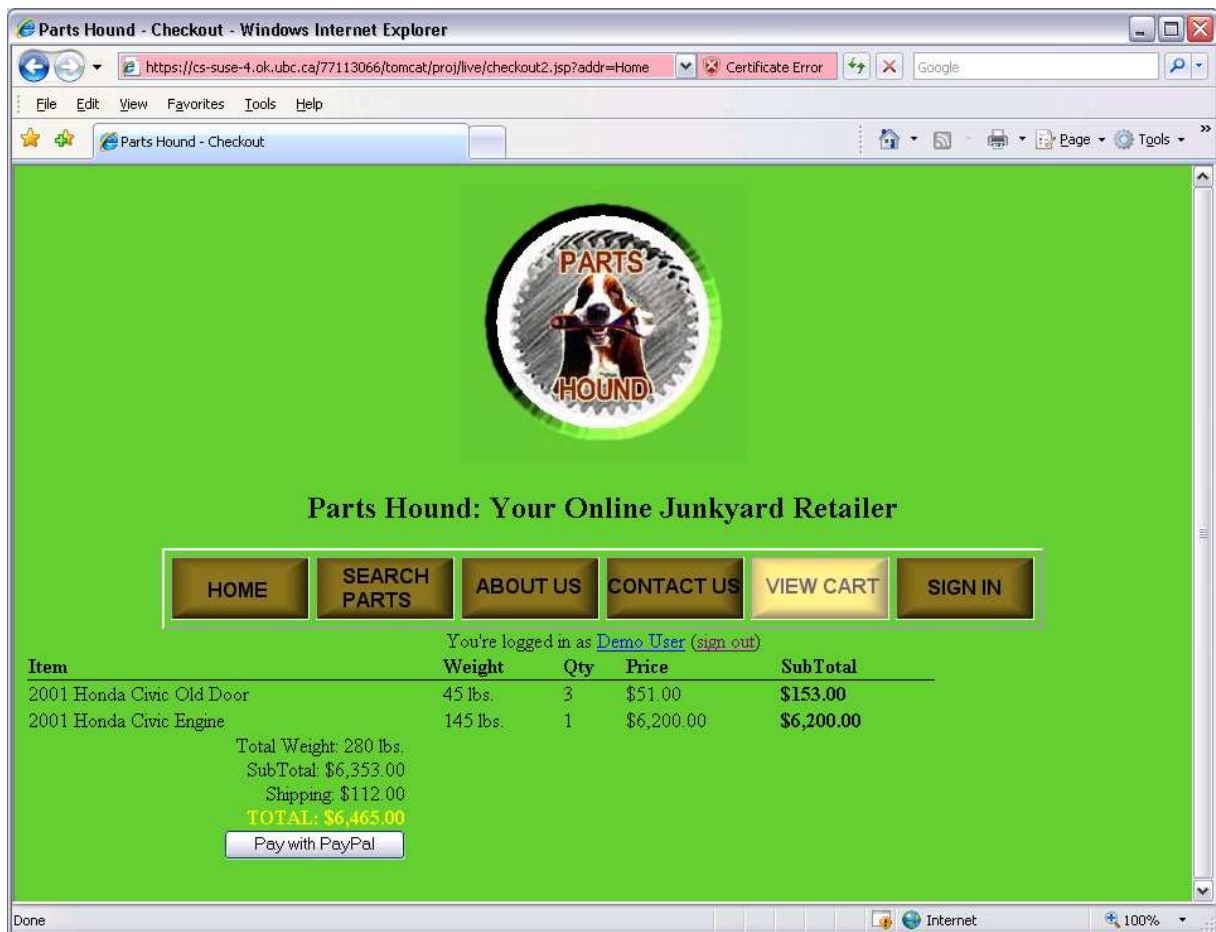
From this page, you can update the quantities of the items you wish to purchase or remove them entirely if you change your mind. PartsHound won’t let you add more quantities of an item if it exceeds the in-stock amount. Try entering 999 for the quantity of any item in your cart.

Now let’s update the quantities to something more realistic. Let’s assume that you want and additional two doors. Enter 2 into the doors quantity field and press the Update Quantities button. Notice the price breakdown under the form buttons represent the new values.



3.6 – Purchasing Your Shopping Cart Items

Now that you’ve found what you’re looking for and updated your shopping cart’s quantities, let’s purchase your items. Click on the *Proceed To Checkout* button to advance to the first stage of the payment process. You’ll be prompted to select an address for your items to be sent to. All PartsHound customers can add multiple addresses to their account, however, since we have just created our account we can only select the *Home* option. Ensure the *Home* option is selected and press the *Proceed To Payment* button.

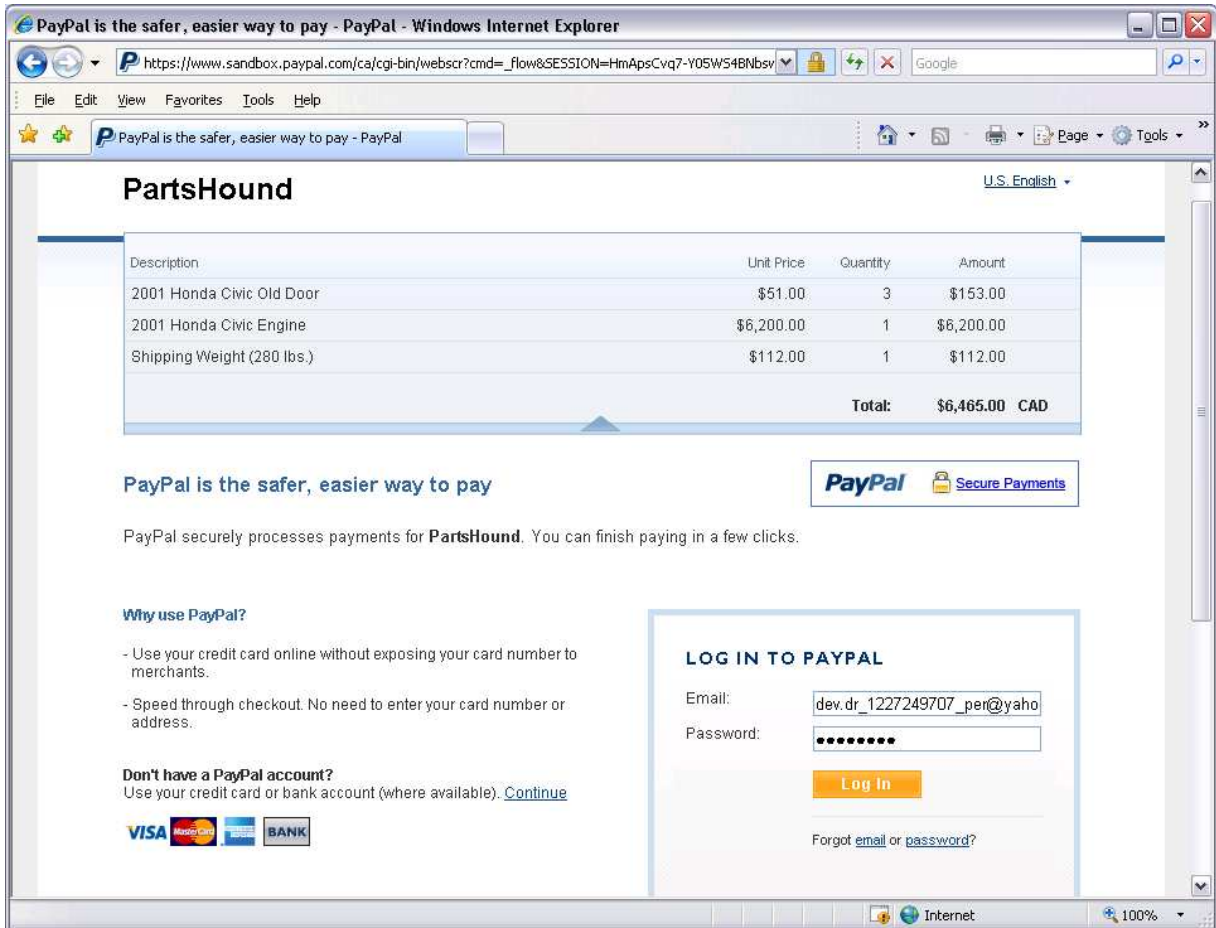


PartsHound has teamed up with PayPal to ensure your online transactions are secure and protected. You may purchase your items with an existing PayPal account or use your favourite credit card. For the purposes of this walk-through, we’ll assume you want to use an existing PayPal account. Review the item breakdown and press *Pay with PayPal* to pay for your order. PartsHound will send you to the PayPal website with an itemized invoice.



3.7 – Paying with PayPal

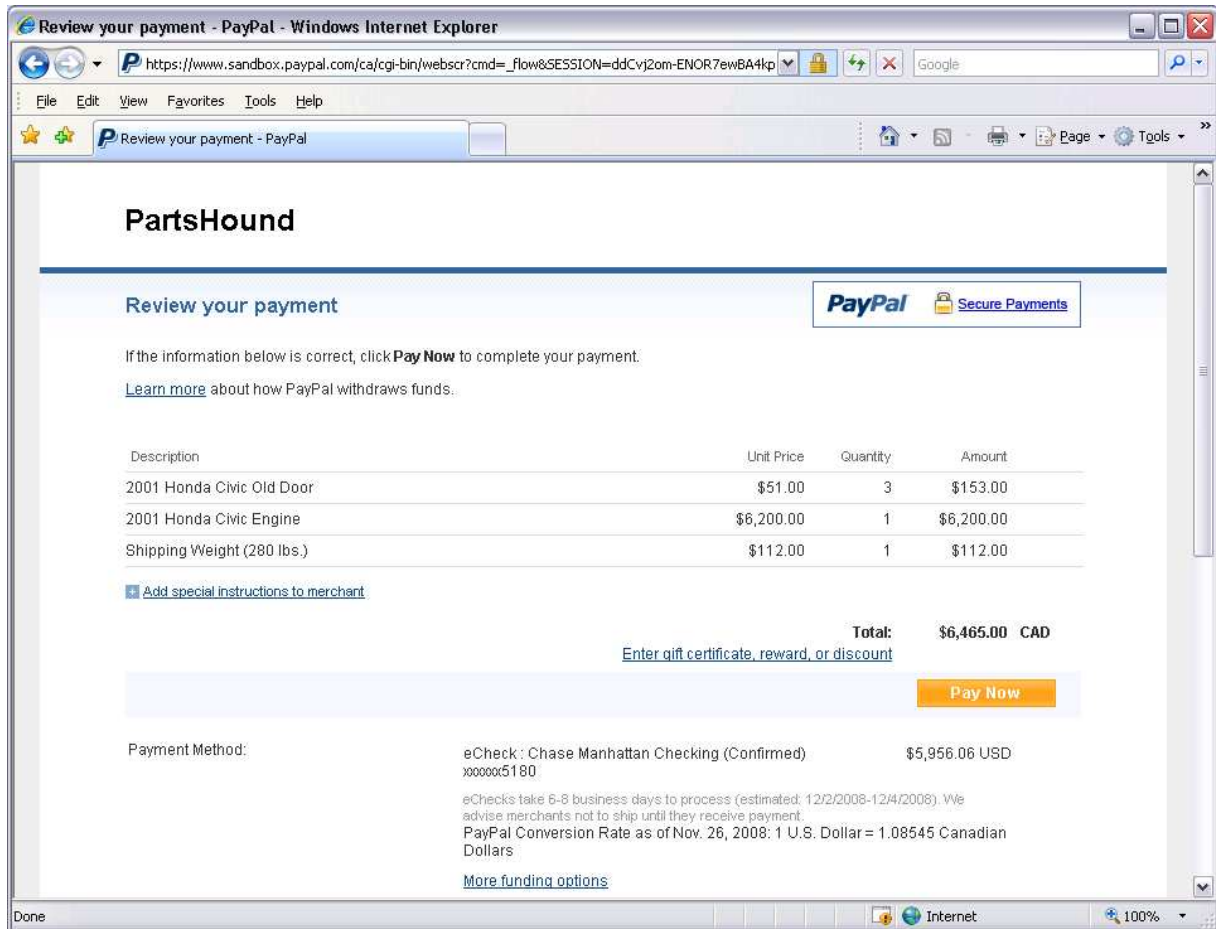
PayPal gives you the opportunity to review your purchase before you apply a payment. To review your order, click on the blue arrow under the invoice total amount.



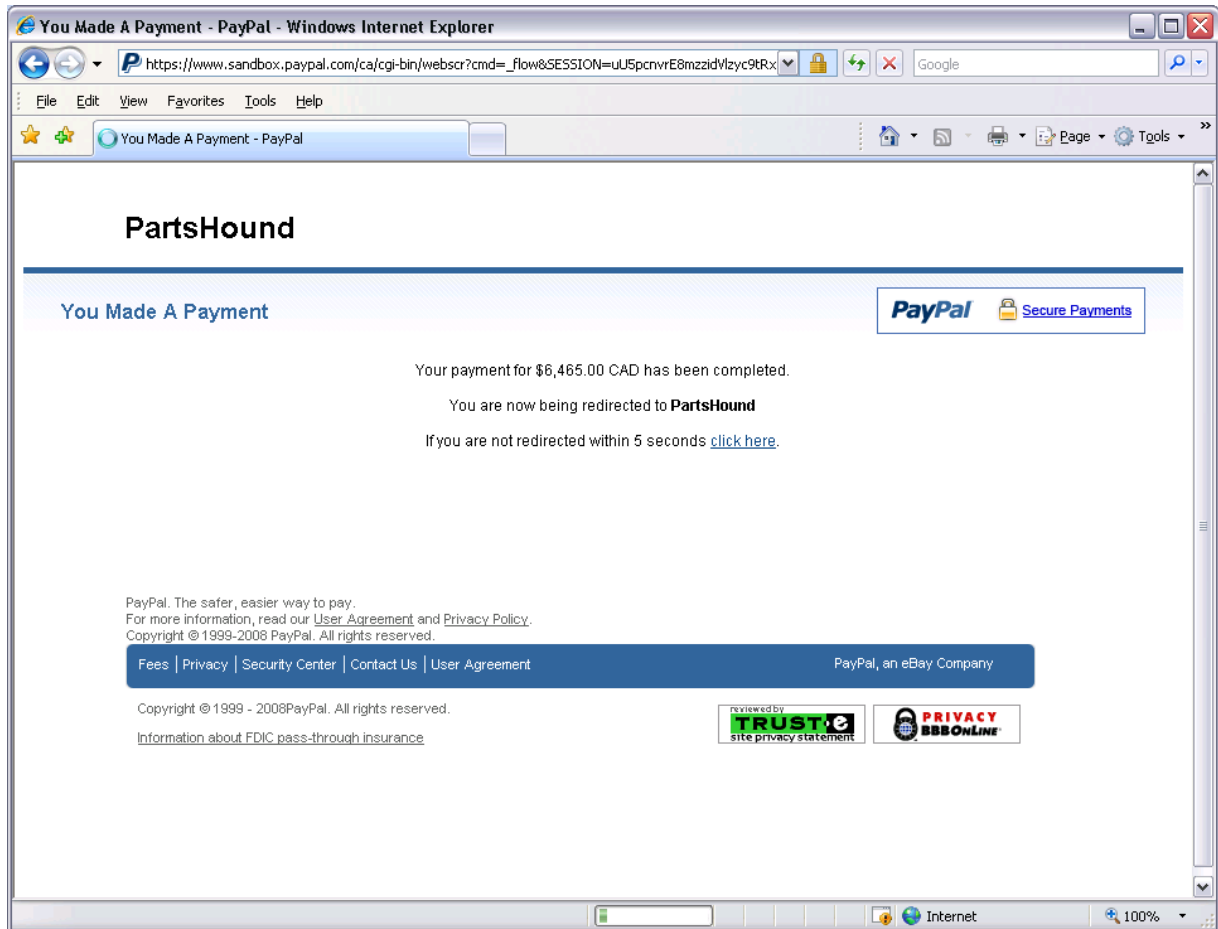
Once you're satisfied with the invoice, you can log into PayPal with the following credentials:

Username: dev.dr_1227249707_per@yahoo.com (note the underscores and period)

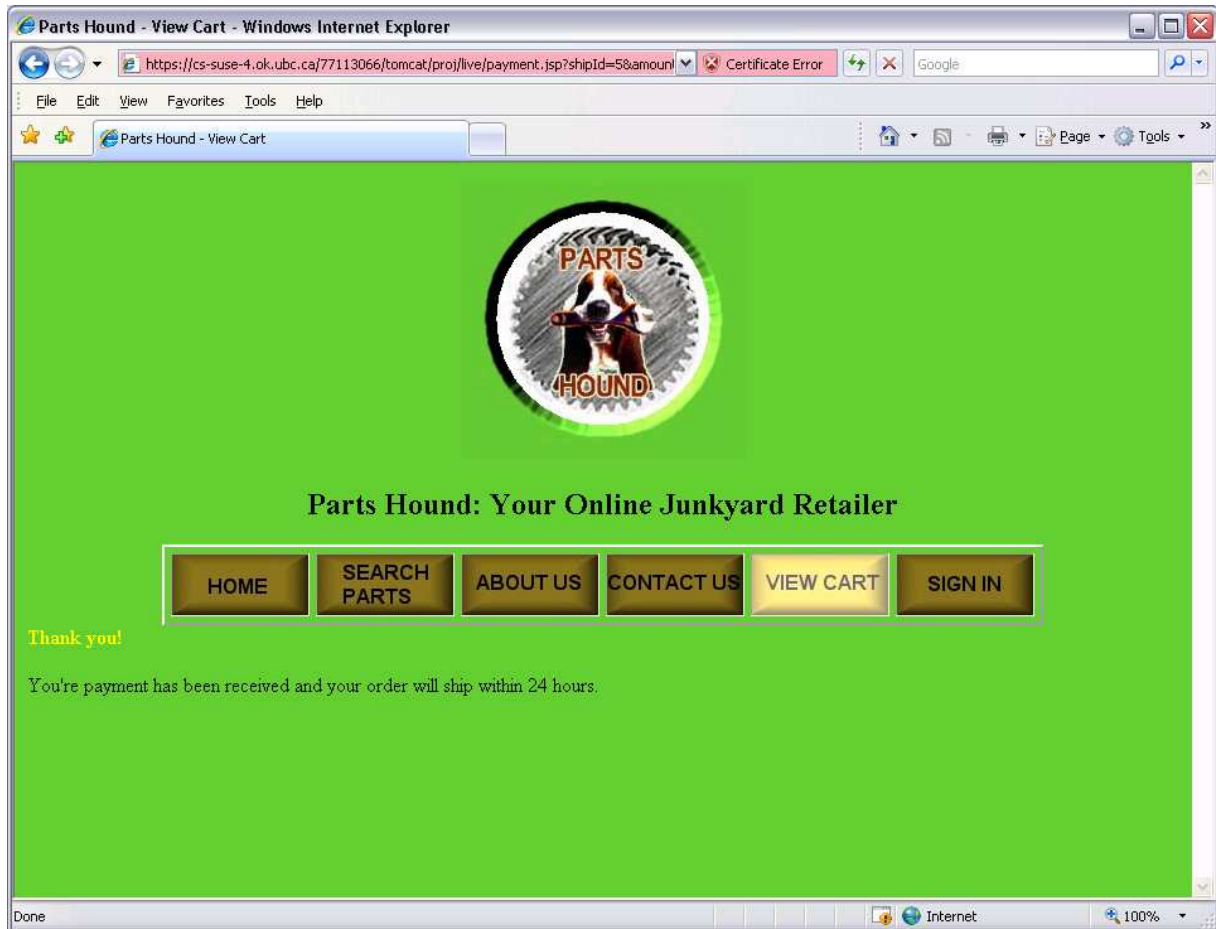
Password: 12345678



Click the Pay Now button to apply a payment to your invoice.



Once your payment has been applied, you'll receive a confirmation screen along with a message indicating that you will be sent back to the PartsHound website to finish your transaction. Simply wait the 10 seconds and you will be redirected automatically.



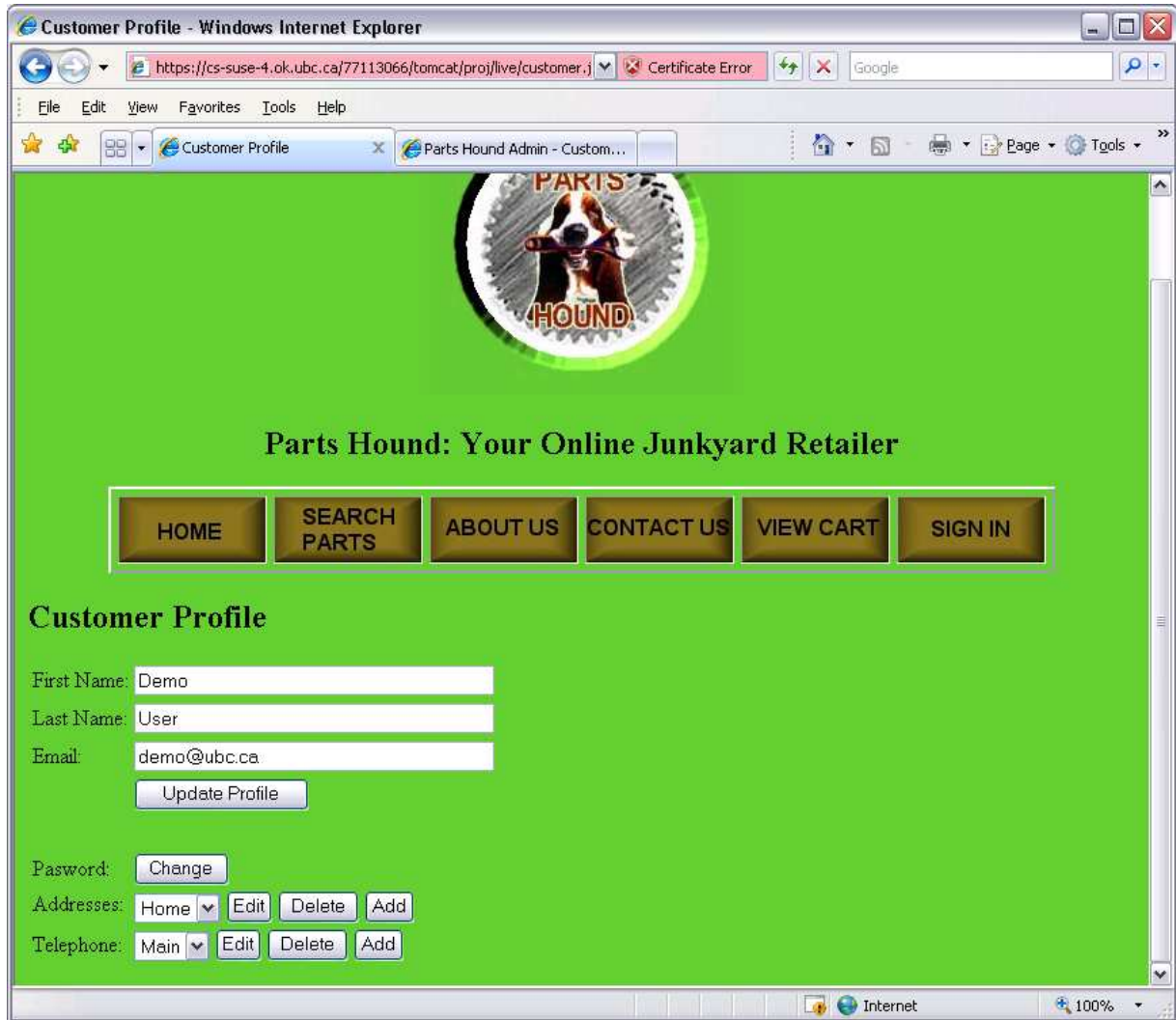
Once you arrive back at the PartsHound website, you'll see a status message indicating that your items will ship within 24 hours. If your payment was declined, you'll receive a message that informs you that your items have been cancelled.

Within the database, the inventory items you selected for purchase are deducted from the in-stock quantities and the shipment status was updated to reflect a received payment.



3.8 – Updating Customer Profiles

You may update your customer profile when signed into the PartsHound website by navigating the Home page and click your name under the menu bar.



From this page, try changing your password along with adding or modifying your addresses and telephone numbers.

3.9 – Signing Out

To sign-out of PartsHound, navigate to the *Home* page and click the sign-out link next to your name under the central menu.



4 - Detailed Implementation Description

PartsHound was designed to facilitate customer user requirements from the front end of the application. Customers don't need special privileges to view the website, search the inventory, and add items to their shopping cart. Only when a customer wishes to purchase their items are they required to sign-in and/or register.

For PartsHound staff, there is a backend component to the application which requires elevated privileges. The backend component allows staff to enable and disable customer profiles, manage administrator user accounts, view generated invoices with detailed line items, and manage inventory.

Every attempt was made validate incoming user data to protect against SQL-injection attacks. Form data is validated on the client-side using JavaScript and again on the server-side using regular expressions.

A basic exception handling system has been implemented to allow for more user friendly error reporting should any Java exception be detected.

PartsHound contains three advanced features which allow the business to compete with rival online parts retailers advantageously:

1. **Parts Compatibility** – PartsHound uses its database to store relationships between vehicle manufacturers who use common parts between them. This feature allows customers to maximize the value of their purchase by giving them the opportunity to select less expensive auto parts that might not be immediately known. PartsHound will automatically incorporate compatible parts in each search query.
2. **PayPal Integration** – Other online auto parts retailers take the unnecessary risk of acquiring customer credit-card information and processing the transaction internally. PartsHound uses PayPal, a trusted third-party payment gateway with a reputation for reliability and security, for all customer payment transactions. PayPal allows PartsHound customers to choose the method of payment that best suits their needs along with the added security of valid SSL certificates.
3. **Parts Images** – Images of parts are made available within the search results. Each photo can be enlarged allowing customers to more closely inspect their potential purchase.

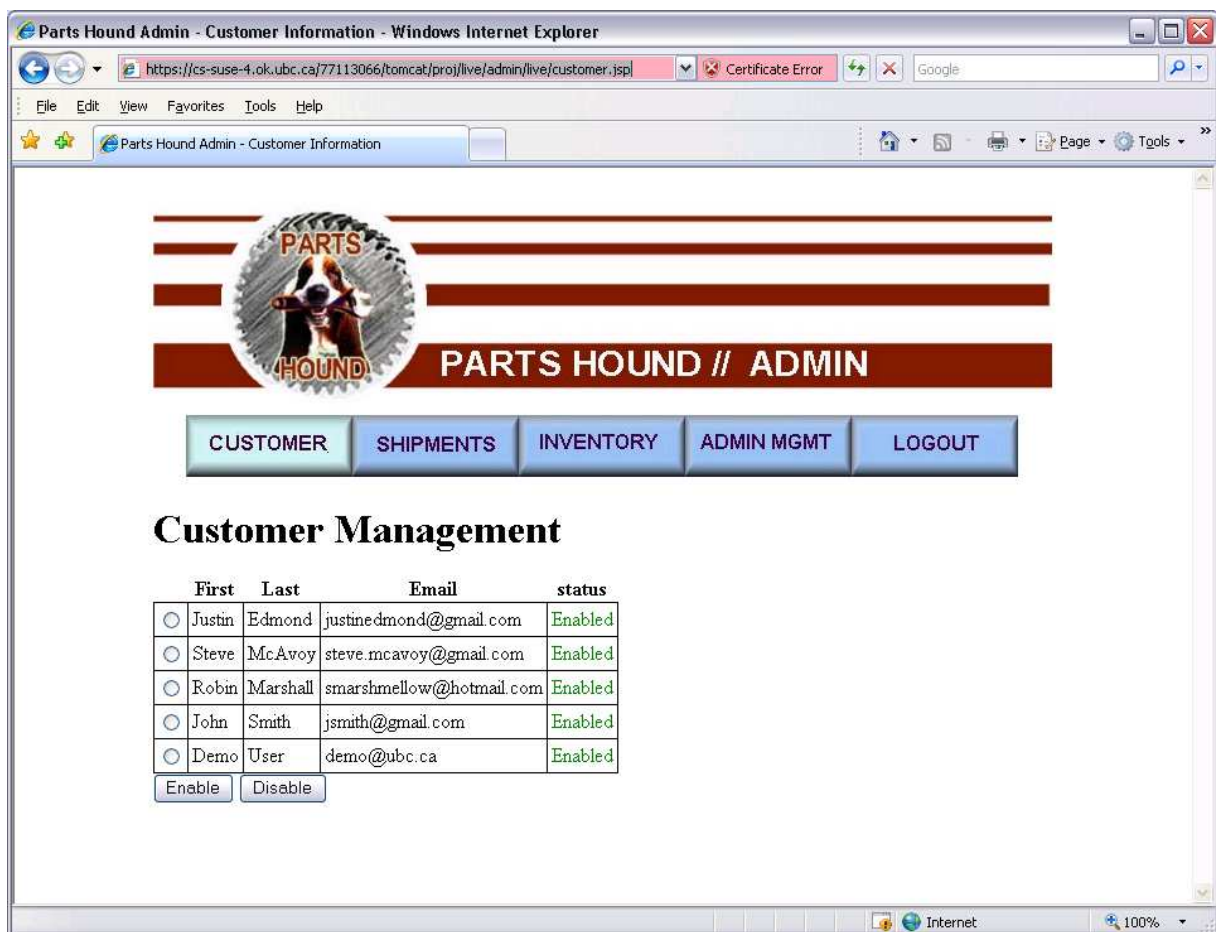


4.1 - Administration Back End

The application back end requires administrators to log in. The authentication system generates a random token value which is encoded using a SHA1 hashing algorithm. The resulting value is stored both within the *Admins* relation and on the client browser by means of a session cookie. This prevents cookie hijacking and allows only one user of each username to be logged in at any one time.

To access the back end component, open a new browser window and navigate to <https://cs-suse-4.ok.ubc.ca/77113066/tomcat/proj/live/admin/live/index.jsp>. The administrator login will be presented. Credentials to the administration section can be found in Appendix A.

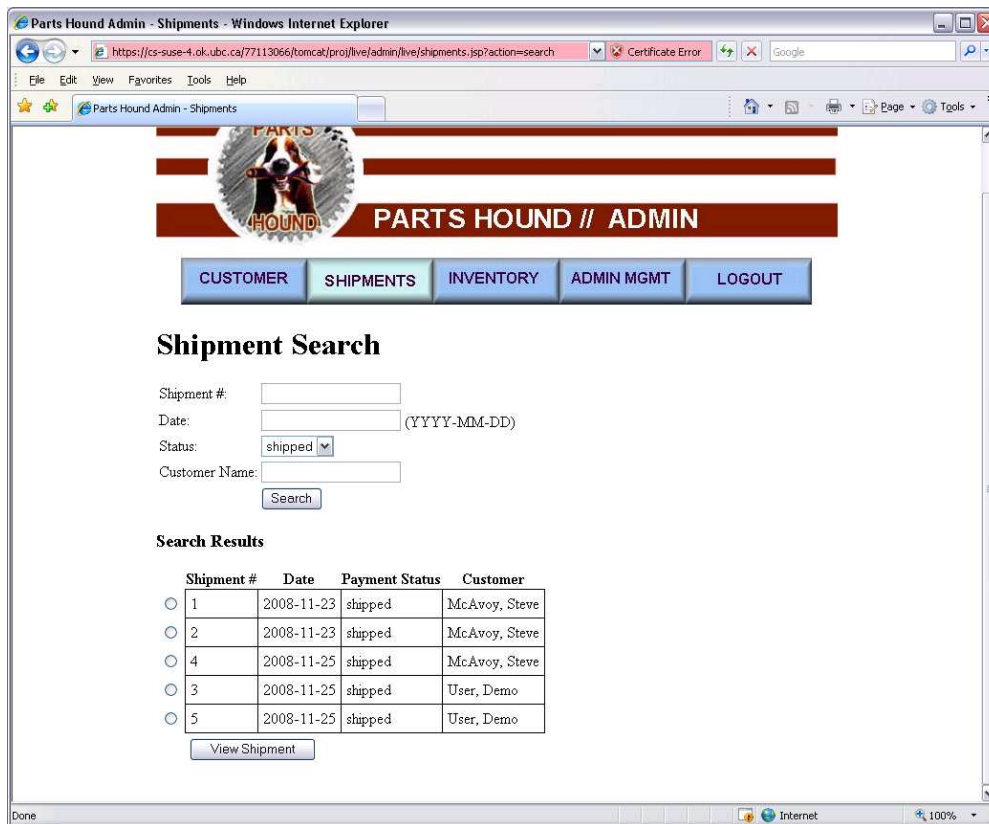
4.1.1 - Customer Management



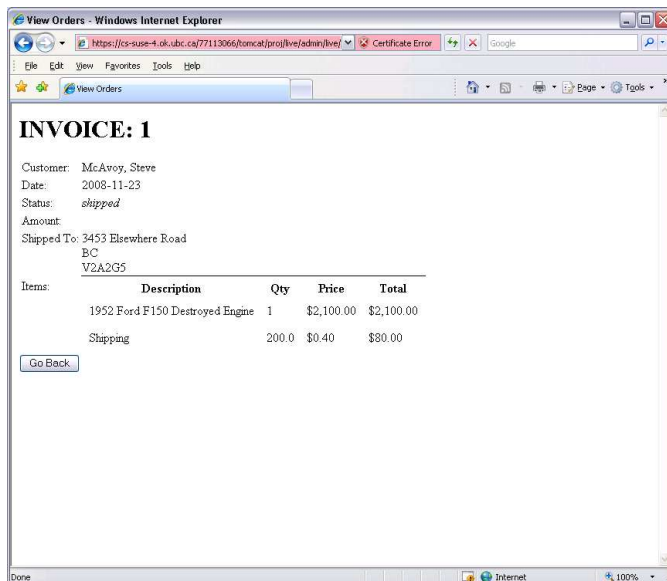
Customers can be enabled or disabled within PartsHound. Customers cannot be deleted as they may have made purchases and therefore would violate database integrity. Disabling a user simply prefixes a special character to the customers' password hash field – invalidating their password to an unobtainable value. Enabling a customer profile, reverses the process.



4.1.2 – Shipment Management



Existing shipments can be viewed through the shipment management feature. Administrators are not allowed to modify shipment information as to not corrupt accounting information.





4.1.3 – Inventory Management

Inventory Management

Vehicle Brand:
Vehicle Model:
Year:
Part Description:

Search Results

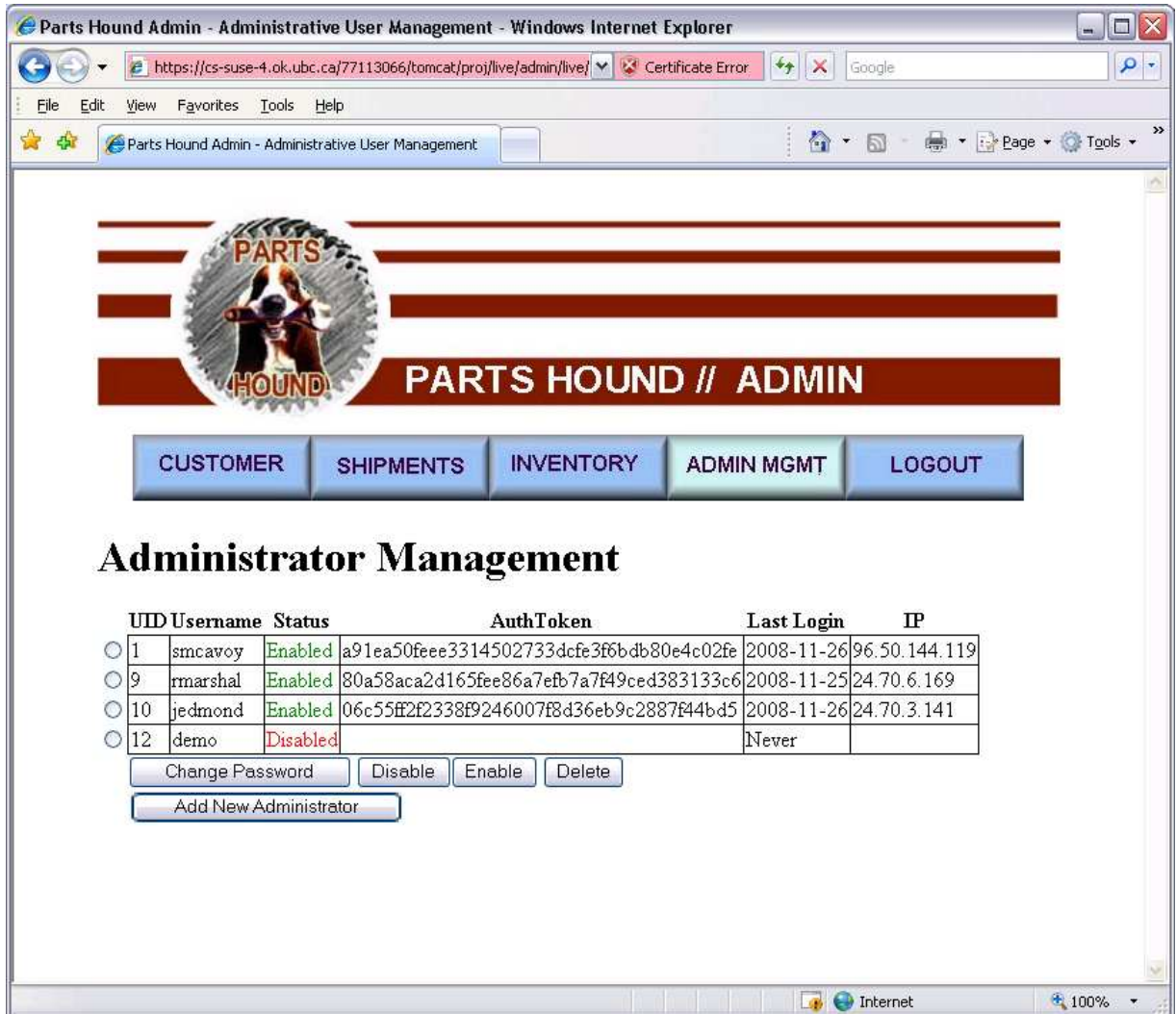
PartsHound found 5 exact part match, and 1 interchangeable parts:

	Relation Id	Item Id	Original Vehicle	Item	Weight	Price	In Stock
Wheel(s)	<input type="radio"/> 3	1	2001 Honda Civic	Wheel A black like new condition steering wheel	2 lbs.	\$15.00	1
Bolt(s)	<input type="radio"/> 4	4	1952 Ford F150	Old Bolt A rusty bolt	1 lbs.	\$2.00	0
	<input type="radio"/> 4	5	2001 Honda Civic	New Bolt A band new Bolt	1 lbs.	\$1.00	200
Door(s)	<input type="radio"/> 6	6	2001 Honda Civic	Old Door Has a bit of rust, but some paint will fix it.	45 lbs.	\$51.00	19
Engine(s)	<input checked="" type="radio"/> 5	8	2001 Honda Civic	Engine Only 765 km, no visible damage	145 lbs.	\$6,200.00	15
Oxygen Sensor(s)	<input type="radio"/> 26	15	2001 Accura Integra	Replacement Oxygen Sensor Unused replacement oxygen sensor	0 lbs.	\$33.00	4

Administrators may edit attributes of each inventory item, such as stock quantity and description. Items not associated with purchases can be deleted. New items can easily be added using the *Add New Item* button.



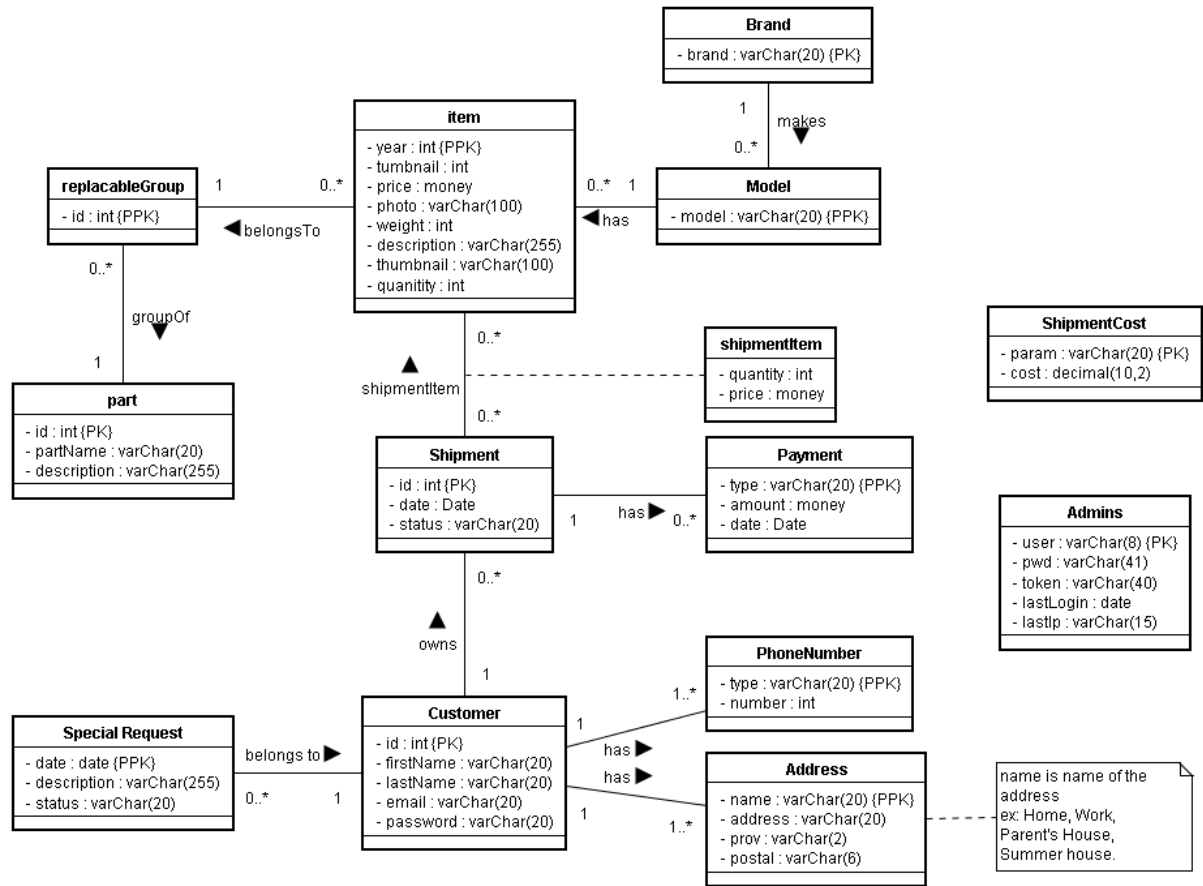
4.14 – Administrator Management



Administrative users can be added, enabled, disabled, and deleted at will. Each administrator has the ability to modify all administrative user accounts. Password may also be changed for each user.



4.2 – Database ER Diagram





5 - File Descriptions

File Name	Description
about.jsp	Brief description of PartsHound.
actionAdd.jsp	Adds a new customer to the database.
actionAddItem.jsp	Deprecated.
auth.jsp	Code library to abstract customer login tasks.
cartadd.jsp	Adds an item to the shopping cart.
Cartdel.jsp	Deletes an item from the shopping cart.
Cartupdate.jsp	Updates the shopping cart quantities.
Changeaddr.jsp	Form and logic to update a customer's address.
Changepass.jsp	Form and logic to update a customer's password.
Changephone.jsp	Form and logic to update a customer's telephone information.
Checkout1.jsp	Asks the customer where they would like their shipment sent to.
Checkout2.jsp	Presents summary of the purchase along with generating required PayPal data.
Contact.jsp	Allows users to contact PartsHound staff by means of an email.
Contact.php	A small utility to send form submissions via email.
Customer.jsp	Form and logic to allow customers to update their profile.
Error.jsp	Exception handler page. All Java exceptions are redirected to this page for user friendly output.
Index.jsp	The entry page for the PartsHound website.
Jdbc.jsp	A small servlet to handle database queries.
Lib.jsp	Master include file which gives each page access to common servlet libraries.
Payment.jsp	Page which PayPal processor redirects to after payment processing. This page updated inventory quantity and shipment status.



Search.jsp	The heart of the PartsHound website. Performs searches based on a variety of search criteria and also cross-references against compatible parts.
Sha1.jsp	Servlet to abstract SHA1 string encoding.
Signin.jsp	Processes customer sign-in requests.
Signout.jsp	De-authenticates customers.
Viewcart.jsp	Presents user with the contents of their shopping cart.
Viewhash.jsp	Deprecated.
Admin/actionAddItem.jsp	Adds new items to inventory.
Admin/actionEditItem.jsp	Processes edits to the inventory.
Admin/addadmin.jsp	Adds a new administrator.
Admin/adminchgpw.jsp	Page to allow administrators to change their passwords.
Admin/adminmgmt.jsp	Main administrator management page.
Admin/customer.jsp	Main customer management page.
Admin/editItem.jsp	Form to allow administrators to edit inventory data.
Admin/error.jsp	Java exception handler for administrator section.
Admin/index.jsp	The login page for administrator access.
Admin/inventory.jsp	Main inventory management page.
Admin/logout.jsp	De-authenticates administrator users.
Admin/relatedIdSearch.jsp	Allows administrators to search for relevant inventory.
Admin/shipments.jsp	Main shipment management page.
Admin/users.jsp	Main administrative user management page.
Admin/viewship.jsp	Presents administrators with an invoice representation of a shipment record.



6 - Site Constraints

On completion, PartsHound may have the following constraints:

- Every effort was made for maximum browser compatibility. However, given the limited time constraint, the site was developed for maximum compatibility with browsers using the Gecko rendering engine (e.g., Mozilla Firefox). There may be small sections of the site that are not 100% compatible with browsers such as Microsoft Internet Explorer.
- Website HTML is not 100% W3C compliant. While developers strived for perfection, the development process was expedited using HTML development tools such as Adobe Dreamweaver and Eclipse J2EE Web Development Plug-In. These tools are known to produce HTML that does not meet W3C specifications for HTML 4.0.

7 - Conclusion

The development team's main objective was to meet all requirements specifications and to produce an effective online presence. The development team stuck to a rigorous project management plan and completed the project ahead of schedule while completing all major project requirements.



Appendix A – User Credentials

Section	URL	Username	Password
PayPal Sandbox	http://developer.paypal.com	dev.drop@yahoo.com	partshound
PayPal User Account	<when prompted by payment process>	dev.dr_1227249707_per@yahoo.com	12345678
PartsHound Customer Account	https://cs-suse-4.ok.ubc.ca/77113066/tomcat/proj/live/signin.jsp	steve.mcavoy@gmail.com	pass
PayPal Administrator Account	https://cs-suse-4.ok.ubc.ca/77113066/tomcat/proj/live/admin/live/index.jsp	smcavoy	steve