



eCommerce Platform Redesign Project

System Overview

Version 0.5

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1. Objectives

This document is designed to outline the current state of the e-commerce system and operational processes.

This document serves as an overview of the e-commerce application and the components of the business systems relevant to the e-commerce web site.

2. Abbreviations/Acronyms

- ERP – Enterprise Resource Planning system
- CA – Corporate Account, customer record
- RA – Requestor Account, buyer who is approved to place POs
- WMS – Warehouse Management System
- CSR – Customer Service Representative
- CDR – Credit Department Representative
- PO – Purchase Order
- SCR – Shopping Cart Reminder
- Q.C. – Quality Control
- A/C – Abandoned Cart

3. Front-End E-Commerce Architecture

The current e-commerce web site is built from a series of custom-designed HTML and ColdFusion templates. It is a template and module based system using both client-side includes for common interface elements, as well as dynamic scripting to pull product, customer, and order data from the ERP system (Ecometry). This is done via an Apache module that provides an XML gateway that is converted to a sockets connection (the only type of connection that Ecometry will accept). Additionally, the e-commerce web site utilizes a significant amount of data stored in various tables of a SQL Server database. This database and the data it contains are used as a workaround to the many limitations of Ecometry in terms of both what data can be queried and what data can be stored.

The e-commerce web site is only capable of receiving an order, doing a basic mod-10 check to prevent credit card fraud (via Ecometry), and then storing the order in a queue (accessible via a dedicated web page) for manual completion by a Customer Service Representative. Essentially the Customer Service Representative double checks the order data in Ecometry, fills in some necessary information for Ecometry processing, and occasionally makes small changes, such as routing the order to be fulfilled through a specific distribution center.

Note: Client is committed to Ecometry until 2010. Ecometry will be involved in e-commerce transactions in the future.

Issues:

- The current e-commerce web site is currently 5 years old and does not support the future desired growth for e-commerce operations.

- *It doesn't support many desired features like bulk/future orders, quoting, purchasing and requisition, historical reporting and proper customer management.*
- *It doesn't allow Client Customer Service and Sales people to use it as a one stop solution (because it doesn't unify the sales, marketing, and customer service channels).*
- *Currently Ecommerce doesn't support Client's desire to involve their vendors in managing product information.*
- *There are no shared process for processing phone orders and web orders; there needs to be a backend interface that supports phone orders and corporate orders with quotes.*
- *The future e-commerce solution needs to be a strong marketing and sales tool for Client.*

Client management wants the online channel to grow to 50% of sales in 5 years (300-600 orders per week now, which is 20% of total sales).

3.1 Site Map

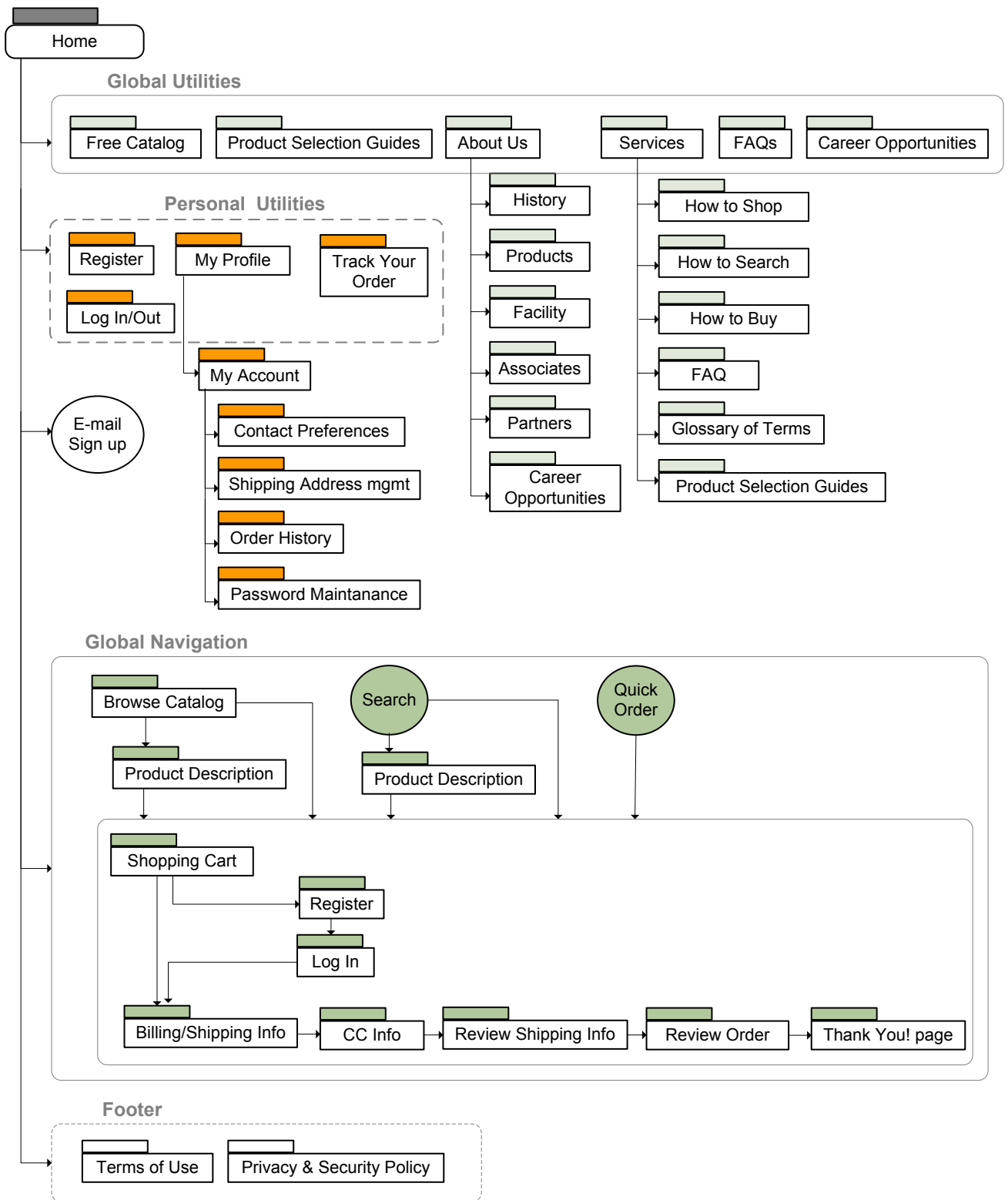


Fig.1 Site Map

3.2 System Diagram

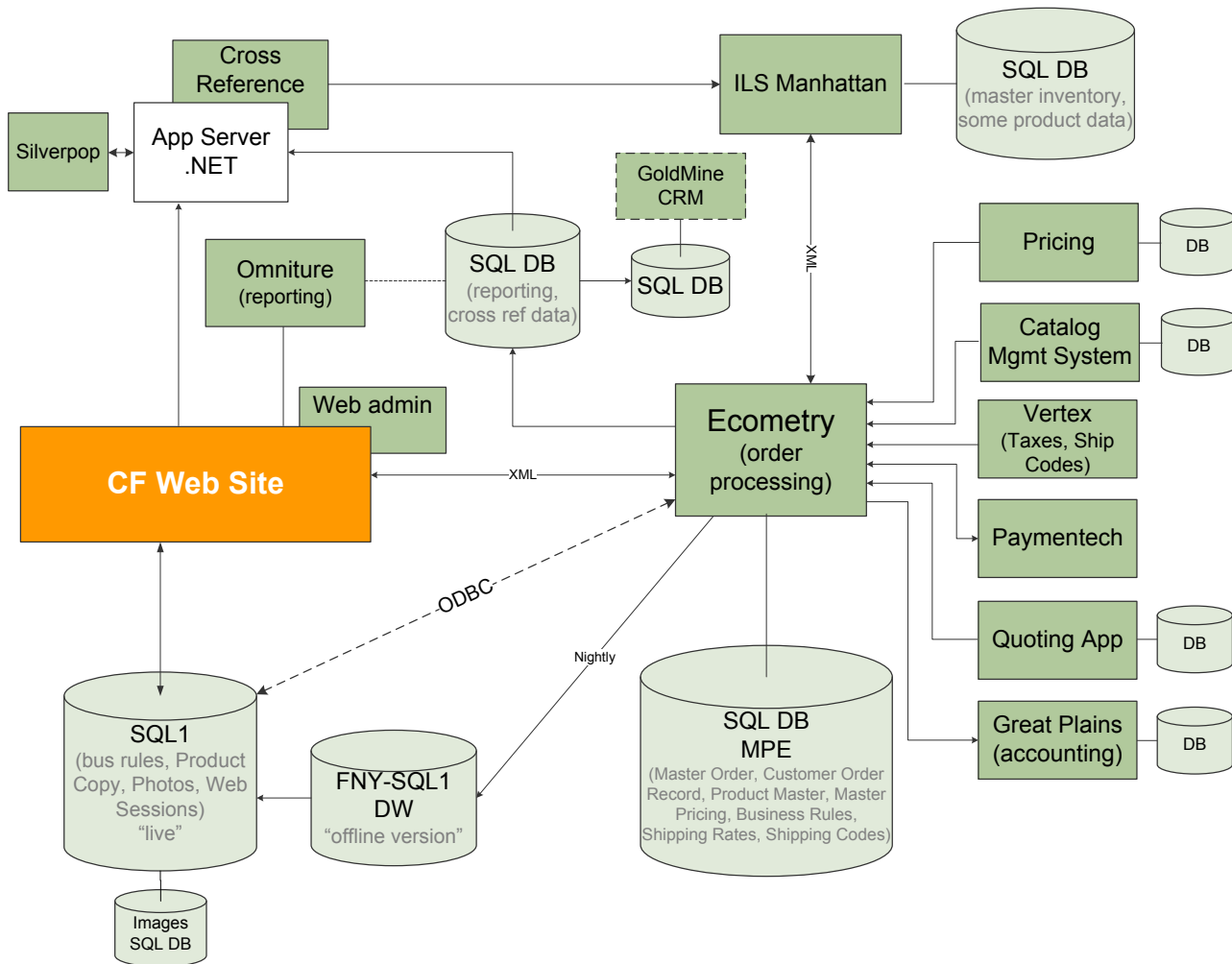


Fig.2 System Diagram

The e-commerce web site is run by a custom-developed **Cold Fusion solution which integrates with legacy ERP system from Ecometry.**

Web application is connected to Ecometry through the XML connection gateway (for product information, user authentication, search, order history look up, order details, new order).

Ecometry has direct ODBC connection to SQL1 – “live” web server, connection to DW SQL database – to refresh data from Data Warehouse (FNY-SQL1 – the database that stores all the data from the data warehouse).

Cross-platform deployment:

- Full integration with Ecometry®
- Custom financial integration with: Paymentech®, Vertex (calculation module for sales tax)
- Integration for Marketing services: Omniture® (reporting), Silverpop® (email marketing)
- Accounting: Great Plains (accounting package)
- Quoting application (MS Access) – application for generating quotes
- Manhattan ILS® (warehouse management system)
- GoldMine® (CRM solution)

- Prologistics (shipping calculations)
- Cross Reference (MS Access)
- Pricing application – calculates prices depending on quantity, whether or not the product on sale (SQL database that holds product pricing data for the enterprise)
- Catalog Management System (MS Access)
- Web Admin (CF)
- Abandoned Cart Application (.NET)

3.3 Pricing and CA/RA records

When a user logs into the website, he is authenticated on the CA record. All the pricing and the order has to be transacted under the customer record (CA).

Once a customer is logged in, Ecometry makes judgment to determine the best price for him (among discount, volume discount, or quote) and sends it to the web site (the best price would be displayed for the customer).

Once an order is placed the customer would have RA (buyer) record. RA is tied to CA account in Ecometry (several RA may be tied to one CA for corporate customers).

3.4 “Upsell5”

Business rules that regulate product behavior on the web site are stored in the field called “Upsell 5” which contains a bunch of tab delimited flags.

Note: Basic product information: item number, EDP (Electronic Data Processing) number, description, inventory status, product status (new, active), keywords, and add-ons.

Upsell 5 is stored in Ecometry as open file; CSR is able to edit it.

The Upsell 5 codes are broken into a few categories: Control, Display, and Shipping. The following are the samples of Upsell 5 tags:

Control:

- LENG – order by length not quantity
- NOADD – Can’t be purchased online. Disables add-to-cart, enables redirect to item detail page, enables “custom product” message (from cart icon or Easy Order), removes grid (e.g., custom signs, custom hardhat logos – items requiring custom grid pricing)
- PROMO – promo item (unable to view details or change qty). Disables ability to modify quantity and click through to ad page only from cart page (used for initial hat/shirt promotion)
- DQZ – Discontinued products (to prevent backorder)
- SRI – Suggested Replacement (show notice)

Display:

- CUS### - customization promotion for various products
- FREE### - free flag for various items (free with purchase items),
- SAMP### - sample files for various products
- REB### - rebate#.html files for various items

Shipping:

- CAL – California exception
- HAZ – Hazardous material
- DEA – for DEA products
- ORMD
- DS – Drop ship
- FOB – Add-on to DSM for FOB from manufacturer items
- FSHIP– Add-on to DSM for FREE Shipping from manufacturer items
- No Qualify – Doesn't qualify for free shipping

3.5 Integrating Ecommerce Application with Ecometry ERP System

A batch download technique is used for copying data (product catalog, customer data, pricing data, inventory, and order-status data) from Ecometry to the e-commerce application.

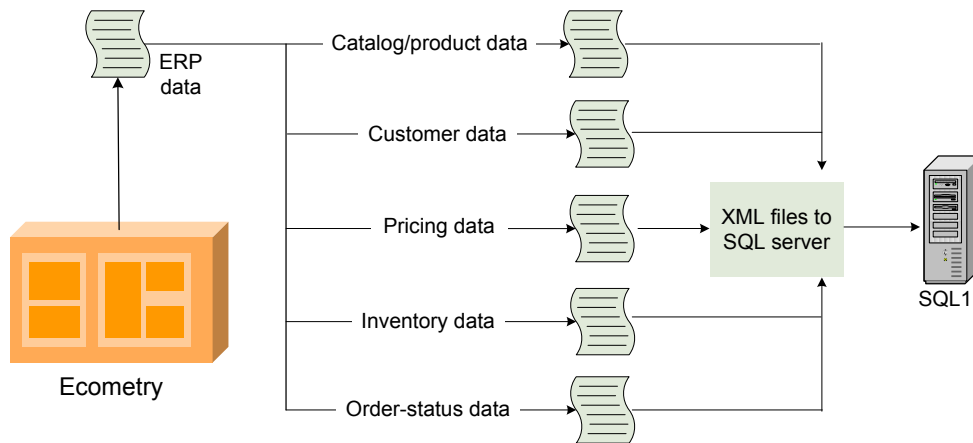


Fig. 3 Batch Download schema

On a regular (nightly) basis, the subset of data that the e-commerce application needs is deleted from the e-commerce database and refreshed with data from the Ecometry system.

This data refresh process takes 1.5-2 hours.

To keep the e-commerce application available while the data refresh process is in progress, there are two versions of the e-commerce database: the online/live (SQL1) and offline (FNY). The e-commerce application can direct all processing to the online database while the batch download is in progress.

When the scheduled extract of Ecometry data is finished, the e-commerce application directs all processing back to the Ecometry system.

The web site is connected to Ecometry directly through the XML connection gateway; there's a set of commands to:

- get product info;
- do a search;
- authenticate a user;
- look up order history;
- get order details;

- do a basic mod-10 check to prevent credit card fraud;
- place an order.

3.6 Web Product Images

Note: Online catalog contains up to 20,000 items (total image size is 130Gb)

Product images are stored on the web servers in a folder.

Each image is named according to the product's EDP number (unique key assigned to each product by Ecometry). The current system allows for EDP numbers of up to 7 digits. Currently, the highest EDP in use are in the 640,000 range.

Images reside in a folder in P subfolders based on their EDP number in groups of 1,000. For example:

| EDP | subfolder |
|-------------|-----------|
| 1-999 | P1 |
| 1000-1999 | P1000 |
| 2000-2999 | P2000 |
| 13000-13999 | P13000 |

If an EDP is less than 7 digits the preceding spaces are replaced by zeros. An item with an EDP of 34987 would translate to 0034987 and would be stored in /imagefolder/P34000/.

In the current web site, there are 4 possible images for each EDP. The first is the main image for the product which appears on the item detail page. This image is 200x200px and using the example above would be /imagefolder/P34000/P0034987.jpg.

The other possible images are built off of this image's file name. A thumbnail image (100x100px) is used for search results, shopping cart listings, featured products, etc... and would be named /imagefolder/P34000/P0034987T.jpg. The only difference in the name is the addition of the T on the end (that stands for thumbnail image).

Another possible image is the Optional or Alternate image. Like the main thumbnail it is 100x100px and provides an alternate product view. The best example of this is in eyewear. The main thumbnail would be a tabletop shot and the optional image would be a model shot. The optional image would be named as follows: /imagefolder/P34000/P0034987O.jpg. The only difference being the O at the end (that stands for optional image).

The last image would be the Big image. This is 400x400px and is used to show more detail as a pop-up on the product detail page. The big image would be /imagefolder/P34000/P0034987B.jpg (note that the B on the end of the file name stands for big image).

All images are "Saved for Web" in Photoshop using the default "JPEG High" settings. Images are uploaded to the "Staging" server via a Samba connection (//stagingweb/imagefolder/PXXXXX/) and are propagated across all of the web servers (/imagefolder/PXXXXX/).

4. System Components Overview

The following sections will provide a basic overview of the components of the business systems relevant to the e-commerce web site.

4.1 Ecometry (ERP System)

Ecometry is the current client's ERP system of record. It houses core business data including basic product records, product pricing, customer records, processed orders, and financial data.

Ecometry provides a terminal interface which is used by customer service representatives to accept and process phone orders. It integrates with a payment gateway provided by a Bank to authorize debit and credit cards (via Paymentech), and hands off processed orders to Manhattan (the warehouse management system) for fulfillment.

Ecometry also integrates with Vertex (a calculation module for sales tax), Great Plains (an accounting package), a custom Quoting application (MS Access), and a Catalog Management System.

Both DW and webSQL1 are used to run queries for the web site. DW is used to clean the data as Ecometry doesn't enforce cleaning and maintaining the data. DW cleans Ecometry data by refreshing its copy of data from Ecometry on a nightly basis. Each night, Ecometry feeds the data at 12:30am via OLEDB driver (Minisoft) to DW database which cleans, transforms, prepares the data and feeds it at 4:30am via direct SQL connection to SQL1 database.

Issue: *Data Quality – Ecometry allows multiple e-mail addresses for a customer but it is designed to hold one e-mail address per customer (this may need further investigation).*

Issue: *Speed – needs to improve search – now they deals with data that has not been indexed (lots of files).*

Note: *Client has tried to create a third-party index in the past, but has not been successful.*

The following data exists in the ERP system and is accessible to the Commerce Server application:

- Customer info (linkage between CA and RA)
- Customer type
- Product catalog (including SKU numbers, vendor information, and availability)
- Product info details: EDP# (internal unique number, unique key, auto generated), description, inventory status, product status, keywords, style details
- Pricing data
- Order status and history
- Contract info
- Shipping info
- Keywords
- "Upsell 5" – file that contains a number of flags regarding how a product should behave on the web site (space delimited string - list of attributes, used for the web only).

Additionally, algorithms and business rules:

- Credit card processing policies
- Product authorization rules
- Contract Business rules (pricing)

The following data from the Commerce Server application must be sent back to the ERP system:

- Customer Record
 - Inquiry (in customer record)
 - Company record
 - Buyer record
 - Ship to
- Customer Orders
- Cart
- Session storage:
 - Temp address
 - Carts, etc.

While the Ecometry system is extremely inflexible and limited in its capabilities, it is Client's critical business system of record, and must be dealt with.

Proposed Solution: *e-commerce platform synchronizes data with Ecometry, but maintains a fully independent dataset so that the web site's performance and availability are not affected by Ecometry's system performance.*

It serves all site content (via a Content Management System) and completes all phases of the checkout process, and only looks to Ecometry to hand off a fully completed order. If Ecometry is down, e-commerce can and will queue the orders until Ecometry becomes available again.

4.1.1 Ecometry Maintenance

Soft maintenance

- Client has stopped version upgrades to Ecometry (fears for DB changes). They use patches.
- The test account (VER) is updated first, and then the issues are fixed, the live account is updated.
- A couple of updates have taken over a year; the last version upgrade was in December, 2006 to version 6.1. (**The client has now stopped version upgrades. The latest version 7.0 is Open Systems;** but this would require a change in hardware)

Testing procedure: each department tests its own part of Ecometry (records for customers, catalog), then the new version is uploaded to the live server.

The data is backed up every night (two backups per night – full back up).

Issue: *There have been cases where signed in users are not able to check out – soft failures (when Ecometry refreshes nightly, there is a process that monitors for issues. Client documents procedures if any issues arise during the refresh).*

When issues arise with the Ecometry system that can't be addressed in-house, the process for logging a help ticket and getting resolution for these issues can take up to a month to resolve. These issues have been a problem in the past with production issues and other issues where a representative wasn't able to process an order.

DB resizing: DB resizing checks that the DB doesn't grow too fast. It takes approximately 15-20 minutes to resize the DB (8:30EST). If the DB needs to be completely resized, it will take longer.

The last time the data in Ecometry was purged was in 2003.

4.2 Manhattan ILS

Manhattan ILS is a warehouse management system that handles pick, pack, ship, and other warehouse management activities. Manhattan integrates with Ecometry via an XML gateway. The e-commerce web site currently has no integration with Manhattan.

Order Statuses in ILS:

- *In Pool*: The shipment has not yet been processed in a wave. No work can be performed against this shipment.
- *Wave Pending*: The wave is being built, but it has not been run yet.
- *In Wave*: A wave run was initiated, but the wave has not been released.
- *Picking Pending*: A wave was released, but none of the work (finding the inventory in the warehouse) has been initiated.
- *In Picking*: At least one work instruction associated with this shipment has been assigned to an employee (to find the inventory in the warehouse).
- *Packing Pending*: At least one work instruction associated with this shipment has been pick confirmed (inventory has been located and picked). It is now ready to be packed.
- *In Packing*: At least one work instruction associated with this shipment has been packed.
- *Staging Pending*: All items of a shipment have been picked, packed, and/or consolidated.
- *Loading Pending*: All items of a shipment have been picked, packed, or consolidated, and/or staged.
- ***Ship Confirm Pending***: At least one container associated with this shipment has been closed. - **this status goes back to Ecometry; tracking # is assigned to the order. ILS sends up the number, tracking # and amount of packages.** ILS places all this summary info in a XML file and Ecometry grubs it out from the folder (this takes about 10 min).
- *Load Confirm Pending*: All shipments on the load have been ship confirmed and the load is ready to be confirmed. At this stage, ILS confirms the tracking number and the number of boxes (no details).
- *Closed*: The shipping load has been confirmed.
- *Delivered*: A shipment or parcel has been delivered to its intended recipient through the system.
- *Complete Rejected To Pool*: System uses this in the status action to indicate that if the entire shipment cannot be allocated; in this case, it will send it back to the pool.
- *Finished Item Is Allocated*: Assigned to a component line when its parent item has been allocated by the system.
- *Component Item Is Allocated*: Assigned to a parent item when the system could not allocate it, but all of its component item(s) were allocated.
- *Immediate Need Pending*: There is at least one shipment detail that is tied to an outstanding immediate need.
- *Delete Rejected*: A quantity on a shipment detail line was rejected. The quantity will be deleted from the system.
- *Rejected*: During allocation, if any quantity on the line is rejected, this status will indicate that rejected quantity.

Note: a single order may have more than one status.

Wave process is the last time to cancel order (wave status or before is when an order can be modified and/or cancelled from a commerce perspective).

Inventory Backorders and Manual Exception Handling:

- Warehouse backorder is entered into ILS as “short pick” and ILS sends “B.O.” status to Ecometry
- Quality Control (QC) group manually notifies CSR and updates ILS and Ecometry inventory

4.2.1 Data integration between Manhattan ILS and Ecometry

The data that is sent from Manhattan ILS to Ecometry during the Ship Confirm Pending status stage includes: Confirmation number, tracking number, and number of boxes

Status (.XML files) is placed in folder (every 10 minutes) and every 10 minutes Ecometry checks for inventory in ILS.

Note: *Currently the e-commerce web site doesn't integrate with Manhattan ILS, but there is an API to query ILS for real-time inventory data. Inventory for web site can ONLY be changed by new feed from ILS.*

Ecometry passes the following data to ILS:

- Orders
- New and modified items
- New and modified PO
- Authorized returns
- Purchase Orders
- Back Orders

The following data is sent back from ILS to Ecometry:

- Orders shipping info
- Containers
- UPS tracking numbers
- POs returns uploads
- Inventory adjustments (update the inventory in Ecometry)

4.3 Paymentech

Paymentech is a payment processing system which is integrated with Ecometry in order to process e-commerce transactions via Discover, MC, Visa, American Express, SmartPay; no checks are accepted online.

Ecometry sends an XML messages to Paymentech every 20 minutes in the morning and every 10 minutes in the afternoon (36 batches per day).

Paymentech services include:

- Address Verification: a service provided through Paymentech Payment Services in which the merchant verifies the card owner's address.
- Authorization: approval by the card issuer to validate a transaction for a merchant. An authorization indicates only the availability of the card holder's credit limit at the time the authorization is requested.

When a credit card gets authorized in the system and the order is modified, the card will get authorized again automatically (2 or 3 times as necessary).

The batch won't be uploaded if there's an issue in reaching Ecometry's modem bank. In this case, it would be sent again automatically.

Statistics:

- Average dollar value per Order is \$200-210 across the board
- Total gross Paymentech process per day is around \$100,000.00
- Currently credit card purchases are less than 20% of total but Client management is targeting \$250-\$500 million in sales in 5 years where online may take 50% of total billing

Note: Potentially Paymentech would need to be integrated with future e-commerce system directly.

4.3.1 SmartPay

The GSA SmartPay® Program, is a provider of purchase, travel, and fleet cards to agencies throughout the U.S. Government. The GSA SmartPay® Program office manages five contracts with charge card providers: Bank of America, JP Morgan Chase, Citibank, Mellon Bank and U.S. Bank. Through these contracts, agencies are able to obtain purchase, travel and fleet charge cards to support their mission needs.

These cards are processed the same as Master Card and Visa via Ecometry through batch uploads to **Paymentech**.

4.4 Vertex

Vertex is a tax accounting solution which is integrated with Ecometry. It determines the tax rate during the Sales Order Processing, based on the jurisdiction code. Jurisdiction code is the key that determines the tax rate for the given transaction based on the ship form and ship-to address (State, County, City, Zip Code). Client's transportation preferred provider is FedEx.

Note: a customer may call to CSR and ask about drop shipment or pick up. In this case, no shipping or handling will be calculated and charged for the order.

Note: Potentially Vertex would need to be integrated with future e-commerce system directly.

4.5 Omniture

Omniture is a Web Analytics tool integrated with e-commerce; it is used for the current web site to provide reports reflecting real-time information and event-triggered alerts (Global JS file is the core data collection engine).

- The analytic part of the reports: site statistics, number of clicks, search results (to better understand consumer behavior and preferences from both an editorial and advertising standpoint)
- Online behavior tracking: Actionable, real-time intelligence regarding online strategies and marketing initiatives by quickly identifying and understanding the most profitable paths. Real-time tracking provides insights into where visitors are dropping off, what's driving critical success events, and how different segments of visitors interact with web site.

Client customization requirements:

- Created a naming scheme on the pages, based on product categories.
- Tracking the session ID (internal session ID): if customers are managed or un-managed and what pages they're going to and products they're viewing.
- JavaScript-based code in each template.
- To calculate cost of goods and services: added new columns into the DB (product table) with calculations.
- The code has been modified on the home page so that Omniture data is sent directly after the body tag (data was being lost - users would sometimes click off before a page is completely downloaded).

Note: Ominture will continue to be part of the future e-commerce initiative.

The following are the Omniture website performance reports:

- Browsers Report for Client Production
- Checkouts Report for Client Production
- Customer Loyalty Report for Client Production
- Internal Search Terms Report for Client Production
- Login Report for Client Production
- Monthly Unique Visitors Report for Client Production
- Null Search Report for Client Production
- Orders Report for Client Production
- Page Views Report for Client Production
- Pages Report for Client Production
- Product Views (Custom) Report for Client Production
- Products Report for Client Production
- Referring Domains Report for Client Production
- Return Frequency Report for Client Production
- Search Keywords - All Report for Client Production
- Searches Report for Client Production
- Time Spent per Visit Report for Client Production
- Tracking Code Report for Client Production
- Visits Report for Client Production.

4.6 Silverpop

Silverpop is a third party software solution for hosted email marketing. It is a third party service and is not integrated with the e-commerce web site now.

4.7 Great Plains

Great Plains is a Microsoft Business Solutions accounting software solution that is integrated with Ecometry ERP. It doesn't interact with the e-commerce platform.

4.8 Quoting Application

The custom Quoting system is an MS Access application which is responsible for generating quotes.

CSR creates a quote (quote number, customer ID number, product number, and price) via quoting application upon receiving a quote request from customer. Quote created can be faxed or e-mailed to customer for review.

Note: *the quote number for one-time quotes wouldn't be tied to customer ID number.*

Usually quotes are valid for 30, 60, or 90 days. After that CSR manually removes them (takes out quote numbers from Ecometry).

Quoted prices are fed into Ecometry (it show up in the purple box); once a customer is logged in, Ecometry makes judgment to determine the best price for a product (discount, volume discount, or quote) and sends it to the web site.

Note: *The future e-commerce system will need to support quoted prices, and may also need to support online quote management/creation.*

4.9 Goldmine

Goldmine is Customer Relationship Management (CRM) solution used in Sales (currently only sales team can use that – to contact with customers: phone calls, e-mails), it has own SQL database.

Goldmine contains the following information about customers: name, phone, e-mail, address, some qualifying information that help sales representatives to make decision about quote for a customer.

Assigning calls is an automated process. The web site creates a log file with the customer number and creates reports (when a new buyer appears in Ecometry, a call automatically get scheduled with a sales representative; six weeks later if a buyer places an order, they receive a follow-up email)

Note: *Goldmine can potentially be integrated with the new e-commerce platform to receive feeds of data about customer behavior.*

4.10 Prologistics

Prologistics is warehouse-based shipping software (owned by UPS; dimension-based calculations), responsible for shipping calculations for Ecometry, it is integrated with ILS Manhattan.

Shipping calculations for e-commerce are done via Prologistics.

Note: *shipping cost for FedEx is calculated via rate table in Ecometry – weight based calculation.*

4.11 Cross Reference

Cross Reference (CR) is a custom built MS Access application that works with a SQL database that matches custom item numbers (provided by managed account customers) and corporate EDP numbers (it displays online as “My Items” for corporate purchasing – managed account customers)

CR stores customer account number, Client Item #, customer specific item numbers (EDP).

Logged in customers (corporate customers) can view their custom product numbers and search for custom items based on these numbers.

The system is also used by sales representatives (or account managers) for invoices. They need to print a batch of invoices every day (Ecometry can't do this).

CR pulls data from DW; ILS system gets that data for shipping info.

Note: *Customers need to be able to maintain their custom item numbers (not realized in the current system).*

Note: *Future e-commerce solution needs to provide this functionality “on the fly” for corporate purchasing.*

4.12 Catalog Management System

The Catalog Management System is a custom built MS Access management system for product information which is fed to the current e-commerce web site.

All product information is accessible through an Access DB via Product Management tool

- Add/editing/deleting categories: category name, category keyword, featured product - > category listing (subcategories): listing name, listing keyword – unique.
- Building products: logo file name, brand name, image caption, product name, headline, sub-head, call to action header, call to action, bullet lead, bullet points, description, details, additional info. Every product builds in staging server. Once a product is build it comes to newitem.cfm (in staging server) for review; once some issue has been found the product development person email/fax it to marketing department to fix this. After a product is tested it would be pushed to both Ecometry and SQL database (keywords, descriptions, names, etc).
- Editing products. Anyone from the company can request for changes – they submit request in XLS file. Depending on the issue the request is addressed to the appropriate group (advertising, copy, web, photography) in marketing department (e.g. if something is wrong, discontinued – it goes to advertising group).
Each week marketing department representatives receive weekly report on the requests submitted last week (anything that relies to product). They pass through the catalog and make all necessary changes in both catalog and online. Once any changes are applied to catalog via web admin – it would be immediately affected on the web site
- Sale keywords: in order to show a product “on sale” on the web site the keywords (sales offers) should be created.

4.13 Web Admin

The Web Admin tool is a custom built ColdFusion and MS SQL application used to manage products and process orders.

Currently it is the only way to process web orders and to manage certain back office tasks related to e-commerce.

- CA/RA admin: Updates customer info in order to process new web orders (via Ecometry).
- Shopping cart e-reminder: Process for a customer service representative to send an email to customers when they have an incomplete order in their shopping cart, or if a customer needs help to place an order (also called Abandoned Cart Program).
- Order confirmation admin: Functionality to send a customer a confirmation email if he/she didn't receive an order confirmation or lost their invoice.
- Order retrieval: Functionality to create a copy of the order (by customer request).
- Shipping conf e-mail: Once an order is released, the shipping confirmation email is included with the shipment. One notification is sent per shipment (for phone customers, this is a faxed confirmation).
- Opt-out admin: Functionality to change a customer's contact preferences (if all three options have been changed via the web site).
- Survey Admin: Functionality to manage surveys, receive survey statistics, view all the results; can also be used to send individual e-mails to customers. Customers are presented with a survey after they place an order; once it's submitted, they are redirected to a “thank you page”, and a CSR receives a confirmation email.

Survey tool:

- After the first order has been placed, the survey pops up (demographic info, location, how often do you buy, about navigation, how it was easy, etc.) in order to provide some research for the marketing team about customer satisfaction
- Surveys are stored in NFS1 SQL DB
- Email notification is sent to the customer service representatives upon survey completion
- Currently there is only one open survey at a time.
- Creating survey: different types of questions are possible in building a survey (e.g., text box, drop down, radio buttons, check boxes). These are data base written.
- There is a statistics section for multiple choice questions.
- Catalog Admin: This area is used by Office Services personnel who are responsible for sending/receiving internal email. Once a catalog is requested online, they can select the “process”, and the catalog would be sent to the customer and the record will disappear from Web Admin. A CSR can create an account via this tool: (Customer info, company name, phone number, email, first, last name). Once an account has been created and “process” is clicked, the catalog would be sent to the user and the customer data would be sent to Ecometry (IA – prospect account).

4.14 Abandoned Shopping Cart Application

The Abandoned Shopping Cart application is a .NET application that takes a feed of abandoned shopping cart data from e-commerce and drives follow up e-mails to customers. An abandoned shopping cart is detected by the expiration of a timeout period (20 minutes) with no further user actions.

4.14.1 Campaign Rules

The following are the business rules for online marketing campaigns:

1. Abandoned Shopping Cart = 20 minutes of inactive on the site, with items still in cart.
 - a) Customer logs out of site with items still in cart, by closing browser
 - b) Session times out; triggered by set timer
2. If a customer is already part of an existing Abandoned Cart campaign,
 - a) And a change has been made to their cart, they will continue through their existing campaign stream with updated cart
 - b) And their cart was closed out due to a previous matching order being placed; the customer will start at the beginning of the campaign upon abandoning a new cart.
3. Matching Order Placed

If a customer has placed an order that qualifies as a match to the abandoned cart, they do not qualify for campaign. If this order takes place during the campaign, they will drop off mid-stream

 - a) Determining match qualifications – if one line item in the order place matches one line item in the abandoned cart, it qualifies and customer will be excluded from campaign
 - b) Determining qualifying time frame – if a matching order has been placed within 72 hours prior to the abandoned cart up until the refresh, they will be excluded from campaign.
4. Internal Do Not Contact List
 - a) Account Managers will review their customer base and determine which customers should not be included in SCR campaign
 - b) Account Managers will need to review this list in conjunction with their customer base to add / delete customers...or more frequently, if needed.

5. External Do Not Contact List
Customers that have chosen to “opt out” of this type of email will be excluded from the SCR campaign.
6. Special Offer
 - a) If the last order (on CA level) has been more than 6 months ago, the customer will receive a special offer
 - b) If the last order (on CA level) has been within the past 6 months, the customer will not receive a special offer

4.14.2 Functions / Tables Needed To Run Program

The following are the information need to run A/C program:

1. Refresh Function to Determine if SCR is Applicable
One refresh tool will work for both Managed and Unmanaged Account Shopping Cart Reminder Campaign (Segment information based on Campaign #)
2. Email Header (needs to be determined)
 - a) To
 - b) BCC
 - c) From <sales rep’s email address>
 - d) Subject
3. Stop Reason Code Table
Programmed / Automatic Reasons:
 - a) Opted Out
 - b) Internal DNC List
 - c) Order Match
 - d) Finished Campaign on Email 6 (or 2 for managed)
 - e) Finished Campaign on Email 5 (disqualifies for email 6)
 - f) Bad Email Address
 - g) Cart Was Emptied
Decided by Sales Rep
 - a) Phone call made / order placed
 - b) Minimal \$\$ amount left in cart
 - c) SR just spoke with customer
 - d) Customer does not want emails (contact preferences)
4. Storing Information
At any time during the campaign stream, if a customer “falls off” due to a reason code listed above, information will need to be stored at that point. The following fields need to be stored (when applicable)
 - a) Customer EDP
 - b) Customer #
 - c) Order Match: # of items in cart vs. order that caused campaign to end
 - d) Promo Code at start of Campaign
 - e) Promo Code at completion of Campaign
 - f) Reason Code (for falling off campaign)
 - g) Order Date
 - h) Last Activity Date

- i) Process Run Date
- j) Shopping Cart Reminder Campaign #
- k) Contact # (email #)
- l) Cart Value
- m) Order Value

4.14.3 Abandoned Carts Work Flow (Unmanaged Accounts)

Upon exit of site (via log out, or session time-out), the Abandoned Cart application will send out an email, regardless of time or day:

E-mail #1 (deployment time 22-40 minutes; upon exit of the site or session time-out)

1. Run query to see if the customer had signed up to have their cart emailed them before leaving the site. If yes, the customer will be excluded from this email.
2. Run query to see if they are part of an existing abandoned cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
3. Run cross comparison in the Data Warehouse, during the refresh, for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will be included in this campaign
 - II. occurred within the qualifying time frame, the customer will not be included in this campaign
4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
5. Create Mail records & retain information for analysis (*see functions #4*)

E-mail #2 (deployment time: 24 hours from E-mail #1)

1. Run query to see who
 - a) has received Email #1 but not Email #2
 - b) has signed up for cart to be emailed, but has not yet purchased
2. Run query to see if they are part of an existing abandoned cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
3. Run cross comparison in the Data Warehouse, during the refresh, for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will be included in this campaign

- II. occurred within the qualifying time frame, the customer will not be included in this campaign
- 4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
- 5. Create Mail records & retain information for analysis (*see functions #4*)

E-mail #3 (deployment time: 24 Hrs from Email #2)

- 1. Run query to see who received Email #2 but not Email #3
- 2. Run query to see if they are part of an existing abandoned cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
- 3. Run cross comparison in the Data Warehouse, during the refresh, for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will be included in this campaign
 - II. occurred within the qualifying time frame, the customer will not be included in this campaign
- 4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
- 5. Create Mail records & retain information for analysis (*see functions #4*)

E-mail #4 (deployment time: 72 hours from E-mail #3)

- 1. Run query to see who received Email #3 but not Email #4
- 2. Run query to see if they are part of an existing abandoned cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
- 3. Run cross comparison in the Data Warehouse, during the refresh, for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will be included in this campaign
 - II. occurred within the qualifying time frame, the customer will not be included in this campaign
- 4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign

5. Create Mail records & retain information for analysis (*see functions #4*)

Email #5 (deployment time: 24 Hrs from E-mail #4)

1. Run query to see who received Email #4 but not Email #5
2. Run query to see if they are part of an existing abandoned cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
3. Run cross comparison in the Data Warehouse, during the refresh, for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will be included in this campaign
 - II. occurred within the qualifying time frame, the customer will not be included in this campaign
4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
5. Create Mail records & retain information for analysis (*see functions #4*)

Grace Period Rule: a customer will be put back into the Abandoned Cart stream if: it has been a minimum of 168 hours since receiving Email #5 *AND* abandoned a new cart

E-mail #6 (deployment time: 48 Hrs from E-mail #5)

1. Run query to see who received Email #5 but not Email #6
2. Run query to see if they are part of an existing abandoned cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
3. Run cross comparison in the Data Warehouse, during the refresh, for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will be included in this campaign
 - II. occurred within the qualifying time frame, the customer will not be included in this campaign
4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
5. Run query to see when customer (CA level) placed last order (*see campaign rule #6*)
 - a) If customer has NOT used this offer within the past 6 months, they will receive this special offer
 - b) If a customer HAS used this offer within the past 6 months, they will not receive this special offer
6. Create Mail records & retain information for analysis (*see functions #4*)

Grace Period Rule: a customer will be put back into the Abandoned Cart stream if: it has been a minimum of 168 hours since receiving Email #6 AND abandoned a new cart EMAIL

Pop up (Immediately upon returning customer to the web site)

1. Run query to see if customer has received this pop up
 - a) If customer has not received this pop up within the past week, the pop up will be activated
 - b) If the customer has received this pop up within the past week, the pop up will not be activated and customer will not see this upon returning to our site.
2. Customers that are on any of the Do Not Contact lists will still receive this pop up

Note: *If a customer is entering the site via PPC, they cannot receive this pop up*

Daily audit to be run on a nightly refresh:

1. Run results query to learn and document conclusion of Email #6
2. Run overview report of every cart and its' status / outcome

4.14.4 Abandoned Carts Work Flow (Managed Accounts)

Upon exit of site (via log out, or session time-out), the Abandoned Cart application will send out an email, regardless of time or day. The first email is immediate. The second email is deployed Tue – Fri (1:00 – 4:00 EST). This email **will not** be deployed on Mondays to allow the CSRs time to contact their customers who have abandoned their carts on the previous Friday.

E-mail #1 (deployment time 22-40 minutes)

Refresh will run every 2 minutes

1. Collect any new Abandoned Carts created since the last refresh. Run query to see if the customer had signed up to have their cart emailed them before leaving the site. If yes, customer will be excluded from this email.
2. Run query to see if they are part of an existing shopping cart campaign (*see campaign rule #2*)
 - a) If no, customer will be included in this campaign
 - b) If yes and a change has been made to their cart, they will continue through their existing campaign stream with updated cart information
 - c) If yes and their cart was closed out due to a previous matching order being placed, the customer will start at the beginning of the campaign upon abandoning a new cart.
3. Run cross comparison to Internal Do Not Contact list (*see campaign rule #4*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
4. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
5. Run cross comparison in the Data Warehouse & Ecometry during the refresh for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, the customer will be included in this campaign
 - b) If there is a matching order and it:

- I. occurred outside of the qualifying time frame, the customer will be included in this campaign
 - II. occurred within the qualifying time frame, the customer will not be included in this campaign
6. Create Mail records & retain information for analysis (*see functions #4*)

Each Sales Representative will receive an email at 7:45 am providing them with a link that will direct them to the Shopping Cart Reminder site, which will contain their customers who received the email #1 between 12:00am and 11:59pm the day prior.

This email will not include those customers who placed a matching order since receiving email #1.

The Sales Rep will have the option to either call their customers or manually take them off of the existing shopping cart reminder campaign.

Sales Rep / Support Rep must: manually search in Ecometry for potential order match on the CA (customer) level (*see campaign rule #3*)

- a) If there is no matching order, the customer will receive phone call, unless the Sales Rep chooses to manually remove customer from this campaign.
- b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, the customer will receive a phone call (unless removed from campaign)
 - II. occurred within the qualifying time frame, the customer will not receive a phone call and subsequent activity (for this campaign only)

Note: *Only one phone call attempt will be made, as the next process step is automatically scheduled to occur 48 hours after original Shopping Cart Reminder email.*

E-mail #2 (48 hours upon receiving Email #1; query run at 1:00, 2:00, 3:00, & 4:00pm EST; deployed Tuesday – Friday)

1. Run query to see who received Email #1 but not Email #2
2. Run cross comparison to Internal Do Not Contact list (*see campaign rule #4*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
3. Run cross comparison to External Do Not Contact list (*see campaign rule #5*)
 - a) If customer is not on list, they will be included in this campaign
 - b) If customer is on list, they will not be included in this campaign
4. Run cross comparison in the Data Warehouse & Ecometry during the refresh for potential order match on the CA (customer) level (*see campaign rule #3*)
 - a) If there is no matching order, and the Sales Rep has not removed them from this campaign, the customer will receive this email.
 - b) If there is a matching order and it:
 - I. occurred outside of the qualifying time frame, and the Sales Rep has not removed them from this campaign, the customer will be receive this email
 - II. occurred within the qualifying time frame, or has been removed from this campaign from their Sales Representative; the customer will not receive this email.
5. Create Mail records & retain information for analysis (*see function #4*)

Note: *This email will not be deployed on Mondays to allow the reps time to contact their customers who have abandoned their carts on the previous Friday.*

4.15 DW SQL Database

DW SQL database is an incorporated data warehouse that stores all the data that Ecometry contains (there are no calls to DW from e-commerce).

DW is independent; it processes International duty free and Landing charges, which Ecometry doesn't (or can't currently) process.

Note: Client is thinking about replacing the DW by more standard business intelligence (BI) solution (SAS)

The DW can generate reports which are placed on the FTP server for customers upon request.

Order history reports on the e-commerce web site comes from Ecometry (DW is just a copy of the Ecometry DB).

DW pulls a copy of data from Ecometry every night; it has transformation data package (defines what module has failed)

The DW SQL database serves the following function: getting quick access to clean data and reports (margins, usage, quote pricing checks), mostly for BI purposes.

5. Client's Customers

The client segments their customers into two major segments: managed and non-managed accounts.

Non-managed accounts: Accounts that are smaller to mid-sized customers (spend \$2,500 per year or less in sales), that do not warrant representation and management; Client doesn't allocate resources to manage these accounts over the phone.

Managed accounts (25 % of customers): Accounts that are managed via the phone by a dedicated account manager (also called Inside Sales) or in person by a dedicated Outside Sales staff member. These accounts are further segmented in the following manner:

- Medium-sized customers: greater than 10 employees (\$2,500 - \$20,000 spent per year).
- Med/Large Customers: 20-50 employees, \$20,000 - \$50,000 in sales, Outside Sales or Inside depending on geography.
- Large Customers: \$50,000 - \$100,000+ in sales, Outside Sales, customization (custom products, custom newsletters).
- Jumbo Customers: \$1M+ in sales, customization (custom website, custom newsletters).

There 3 types of Customer Accounts in the System:

- Personal
- Corporate
- Buyer

Differences:

- Step 1: Billing and Shipping info for Corporate Acct – the system would ask them to verify invoice date, invoice #, company #, account #.
- If the buyer provides this info, the system verifies and attaches him to existing corporate account.
- Corporate customer has company name on the left side.
- For personal account: no company name, just first and last name for billing/shipping info.
- Shipping addresses are zoned for corporate account.

- Corporate billing / buyer billing has payment option of “bill my account” or credit card. Personal customers only may use credit card.

There are corporate ties that tie a bunch of CAs. If a user is a corporate tie, he is able to go in and see the corporate view.

Issue: when a corporate customer changes the address, it duplicates the account.

6. Blanket Order Concept

Blanket order is a customer’s approved purchase order that has been pre-approved for a set dollar amount and/or set products and quantities.

Corporate customers request for Blanket/Future order to Customer Department and CSR sets it up (if a customer is never ordered before CSR calling to Credit department for approval - to verify customer pay ability, Credit Department rep may call customer to verify his credit history).

The customer statuses in Ecometry: **active, credit cut off, bad customer**. Ecometry has business rule to determine them (credit limit: if 15 days – credit cut off)

Example1: a customer approved blanket PO 12345 for \$5,000 on three products. Someone will call in and say they want to place a release against 12345.doesn’t keep track of it. The customers keep track of the dollar amount spent.

Example2: a customer approved blanket PO 12345 for \$5,000, but that \$5,000 is comprised of gloves that are to be released on specific date. It’s automatically released on their specified dates.

Issue: The releases are all in the system (Ecometry), it uses up the customer’s available credit. There are other orders that might not go out because they are on credit hold.

The credit limit is applied based on the customer’s credit score, ordering history and credit history. Ifgives a customer a higher score, the Credit Department will allow him to increase his credit limit.

Future orders: created an Access DB to hold blanket orders (not a functional DB, just holding tank). They manually put in two months worth (the current month and the following months’ worth of blanket orders) and specify order releases (go to the future date and specify when it ships). So it’s only two months hitting customer’s credit, rather than 12. If customer wants to change something, CSR corrects it manually and sends the confirmation to the customer.

Note: Currently the client have no controls to help customers make sure they’re sticking within their dollar amounts, or the products they’re ordering are in line – desired to have in the future system as well as the ability to modify blanket orders (by customer) and automatically create future order request.

7. Use Cases and Work Flows

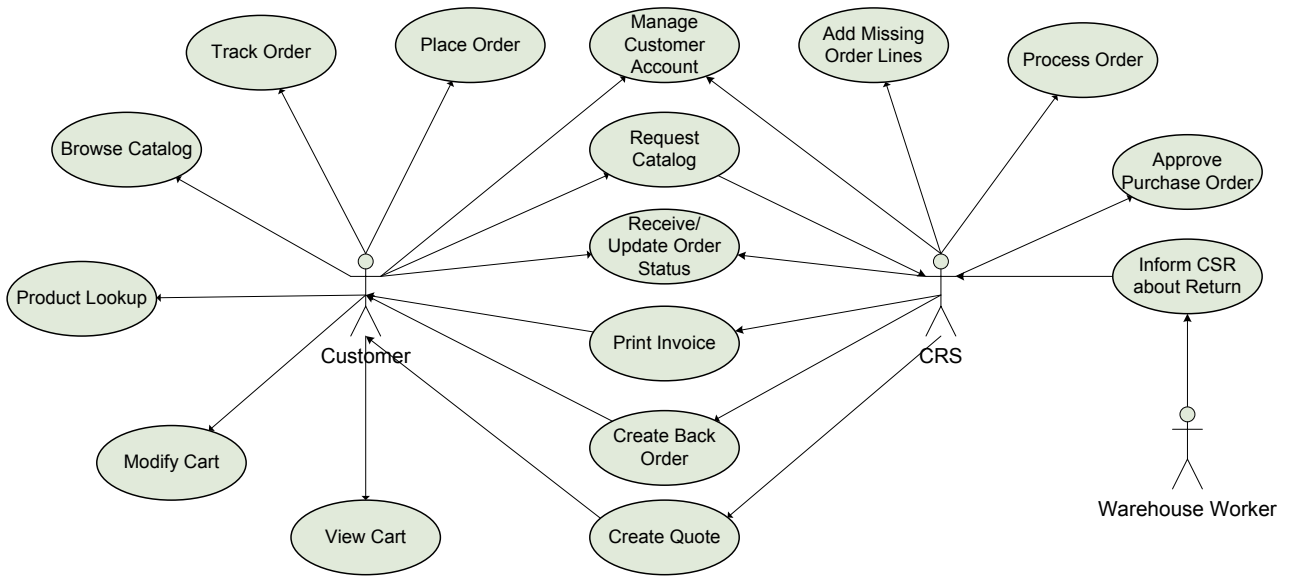


Fig. 4 Interaction diagram

7.1 Use Case: Place Web Order

Actors: Customer, System (E-commerce, Ecometry)

1. Customer provides logon (registration) information on the web site
System confirms correct login
2. System provides the product catalog.
Customer browses through the catalog.
3. Customer enters search string – partial name of a product
System returns all products matching the search criteria
4. Customer selects a product for review.
System presents Product Details
5. Customer adds the product to a shopping cart.
System displays “Shopping Cart” page (item name, qty, price)
Note: Ecometry provides the price (Quoting application)
6. Customer proceeds to checkout
System displays Checkout page, Step 1: billing and shipping info
7. User provides his billing and shipping addresses, selects shipping method through the checkout form
System validates the address details and asks to enter customer payment information
8. Customer provides credit card details.
System displays “Review shipping info” page
9. User clicks on “Continue”
System provides the approximate shipping, package cost, tax and total for the order. The customer is asked for final confirmation to place an order (“Review Your Order” page)
10. User places the order
System returns the unique order number for tracking purposes and customer ID (“Thanks for your order!” page) and sends order confirmation e-mail to the customer.

Alternate Flow (variations of the flow, including less usual cases and error conditions)

- Unregistered user
- Invalid password
- No products matching search criteria were found
- Discontinued product
- Continue shopping after storing a product in the shopping cart
- Enter a new shipping/billing address
- Abandoned shopping cart
- Cancel order

Note: An unregistered user would need to create an account before he can place an order.

New customer: in order for a customer's account be established as an open account, it would automatically come through the Credit Department (credit application tool from D&B) and get their credit limit. If they're not approved, then a CSR contacts the customer in order to set up a credit limit.

Note: Abandoned shopping cart is detected as expiration of a timeout period (20 minutes) with no further user actions (.NET application) – see Abandoned Shopping Cart section

7.2 Use Case: CSR Processes Web Order

Actors: CSR, Web Admin, Ecometry

Note: web admin panel serves only web orders, phone orders are served in Ecometry. Once an order placed in Ecometry, it doesn't come in web admin.

1. CSR selects "Order Confirmation Admin" link in Web Admin and then clicks on "New Orders" (special orders such as Next day, 2nd day, associate orders, Other Ship methods will be at the top). Order needing to be modified is on "Held For Managers Review" status
2. CSR clicks on "View" under details column.
Web Admin provides the specifics about the order
3. CSR goes into Ecometry and enters the order number (CSR has to create RA record – buyer record for a new order in Ecometry).
Ecometry retrieves the order (order # which starts with I – Internet order (created in Ecometry automatically), M – mail, F – fax, P – phone (manually)).
4. CSR clicks on "Secondary Options" -> "Modify order"
5. If the account is new, CSR takes out the email address, password, and buyers name in the CA record to see if it is a duplicate acct. If there is not a duplicate account proceed to next step
 - a1. If there is a duplicate account, CSR clicks on the "Merge"
Ecometry merges these accounts
6. If the order is built as a Personal, CSR removes the P1 in front of the name
7. Once in the order, CSR creates a buyer if needed or makes any changes requested under the RA ("Add New Ship-to" – to modify shipping address for the customer, drop ships, split order, add the UPS/FedEx collect address)
Ecometry updates the RA record
8. CSR comments order (notes for order if shipping address has been changed) and connects buyer to order

Note: Buyer is not attached to an order when it gets placed on the web. A CSR has to manually add

their information to the order.

Ecometry updates the order

9. CSR looks at the exceptions if there are any to see about special products (Hazmat, Drop Ship, Exceeded quantities, etc)
10. CSR adds credit card name if applicable, adds collect account numbers if applicable (UPS, Fed ex, DHL), make any adjustments to freight if needed (Free freight, Drop ship freight, etc.)
Once everything is verified, CSR types "OK TO GO" (3000) in the Order Comments screen in Ecometry so the Credit Dept knows the order has been reviewed
Ecometry updates the order info
11. CSR clicks on "Ship order" in Ecometry and hit "Process" in the Web Admin
Ecometry queues the order.
Web Admin removes the order from "New Orders"

7.3 Use case: Place Phone/Fax/Mail Order

Actors: Customer, CSR, Ecometry

1. Customer calls to sales representative and orders products from the client's Catalog
Sales reps asks him whether or not he ordered from the company before, first name, last name, company, e-mail address, etc
2. CSR initiates a search for customer record into the system (Ecometry).
If Ecometry retrieves the customer record, CSR enters order info and customer info for buyer record (RA). Ecometry creates order and RA for the customer.
 - a1. Otherwise CSR enters customer information, shipping and billing information for both CA and RA. Ecometry creates CA, RA and order record for the customer.
3. CSR adds credit card name if applicable, adds collect account numbers if applicable (UPS, Fed ex, DHL), make any adjustments to freight if needed (Free freight, Drop ship freight, etc.)
Once everything is verified, CSR types "OK TO GO" (3000) in the Order Comments screen in Ecometry so the Credit Dept knows the order has been reviewed
Ecometry updates the order info
4. CSR clicks on "Ship order" in Ecometry and hit "Process" in the Web Admin
Ecometry queues the order.
Web Admin removes the order from "New Orders"

7.4 Use Case: Backorder

Actors: Customer, warehouse worker, Q.C. person, Manhattan ILS, Ecometry, Paymentech

The use case begins when an order comes to ILS and inventory is not sufficient

1. Warehouse worker enters backorder into ILS as "short pick" and ILS sends "B.O." status to Ecometry
2. Warehouse worker notifies a QC person about backorder.
3. Q.C. person calls/emails the customer and manually updates ILS and Ecometry inventory (they freeze the inventory and investigate this).
4. If customer agreed for backorder, it remains into the system (ILS, Ecometry) until the inventory is sufficient. Inventory becomes available again.

- a. Otherwise Q.C. person deletes the order from ILS and cancels it in Ecometry.

7.5 Use Case: Returns

Actors: Customer, Warehouse worker, Manhattan ILS, Ecometry

1. Customer sends the parcel back to NS
2. Warehouse worker receives the shipment, and enters the information about returned order: what's came back, from whom and why, via Manhattan ILS interface;
3. Manhattan notifies Ecometry about the return;
4. Ecometry sends the data to Paymentech to process the return (refund).

7.6 Use Case: Add Add-ons Products

Actors: Production manager (merchandizing department), CMS system

1. Production manager enters a new product info and upsell product numbers (item #, EDP#) via CMS system interface;
2. CMS system creates new record into the Access DB and creates relationship for part numbers for the primary product and upsell product.

7.7 Create New Survey use case

Actors: CSR or marketing person, System (Web Admin)

1. CSR clicks on the "Survey Admin -> Manage Surveys -> Create Survey"
System displays the Create Survey screen
2. CSR enters survey information (dif types of questions: text box, drop down, radio buttons, check boxes)
Set-up e-survey: System generates the web-based interface page for the Product Survey demonstration
3. The system loads the Product Survey workflow definition into the NFS1 SQL database.

7.8 Submit New Survey Use Case

Actors: Customer, System (Web Admin), CSR or marketing person

Customer is provided with survey after he placed an order;

1. System prompts the Customer with Product Survey pop up.
Customer answers on questions in survey and then clicks on the "Submit" button.

2. The System redirects a customer to “Thank You” page and updates the correspondence table into the DB (NFS1) with information from each survey participant's response.
3. The system notifies CSR about submitted survey.
SCR receives confirmation e-mail.
4. SCR goes to “View Results” to view the responses.

7.9 Send Catalog for a New Customer (phone request) Use Case

Actors: Customer, System (Web Admin), CSR or marketing person

1. Customer calls to CSR and requests for a catalog.
2. CSR asks him whether or not he ordered from the company before, first name, last name, company, e-mail address, etc
3. CSR initiates a search for customer record into the system (Ecometry).
If Ecometry doesn't retrieve the customer record, CSR clicks on the “Create Account”, enters customer information: company name, phone #, email, first, last name, and then clicks “Process”.
4. The System sends the customer data to Ecometry (IA status – prospect account).
System initiates the sending catalog workflow.

Alternate Flow:

- Ecometry retrieves the customer record

7.10 Send Catalog for a Web Customer (web request)

Actors: Customer, CF site, Web Admin, CSR or marketing person

1. Web site provides a Customer with “Request catalog” feature.
Customer clicks on the “Request catalog” button.
2. Web site sends the request to web admin.
Web admin displays the request to CSR.
3. CSR clicks on the “Process” button to the right of the request.
System initiates the sending catalog workflow.

7.11 Blanket orders Use Case

Actors: Corporate Customer, Ecometry, CSR, CDR

1. Customer calls to CSR and requests for a blanket order
2. CSR asks him whether or not he ordered from the company before, first name, last name, company, e-mail address, etc
3. CSR initiates a search for customer record into Ecometry.
If Ecometry retrieves the customer record, CDR sets up blanket order (products, quantity, releases) in Access DB and future order for 2 months in Ecometry.

Alternate Flow:

- New Customer (CSR calls to CDR to verify customer pay ability, Credit Department representative may call customer to verify his credit history)
- Customer's credit "on hold" (SCR may call to CDR to increase customer's credit limit)
- Customer wants to change blanket order (CDR corrects it manually and sends the confirmation to the customer)

7.12 Work Flow: Order Processing–Fulfillment

Order processing is handled in Ecometry on a FIFO (first in, first out) basis.

The batch goes from Ecometry to Paymentech (the order status is changed by Ecometry automatically and the system returns the status until the night, it's not real-time system).

Then order is shipped, WMS system returns the status updates to Ecometry (it changes the flag to "shipped") Customers would see the live order status, but ship confirmation would show a delay.

The Order Processing workflow handles the processes from receiving the order to checking customer credit and checking inventory. It then passes control to the Order Fulfillment workflow, which handles shipping and invoicing. When the Order Fulfillment process is complete, control is returned to the Order Processing workflow, which confirms the order completion.

The figure that follows the table provides a high-level depiction of the workflow in Interface View. The numbered steps in the figure are described in the table, which maps the real-world processes to the workflow model.

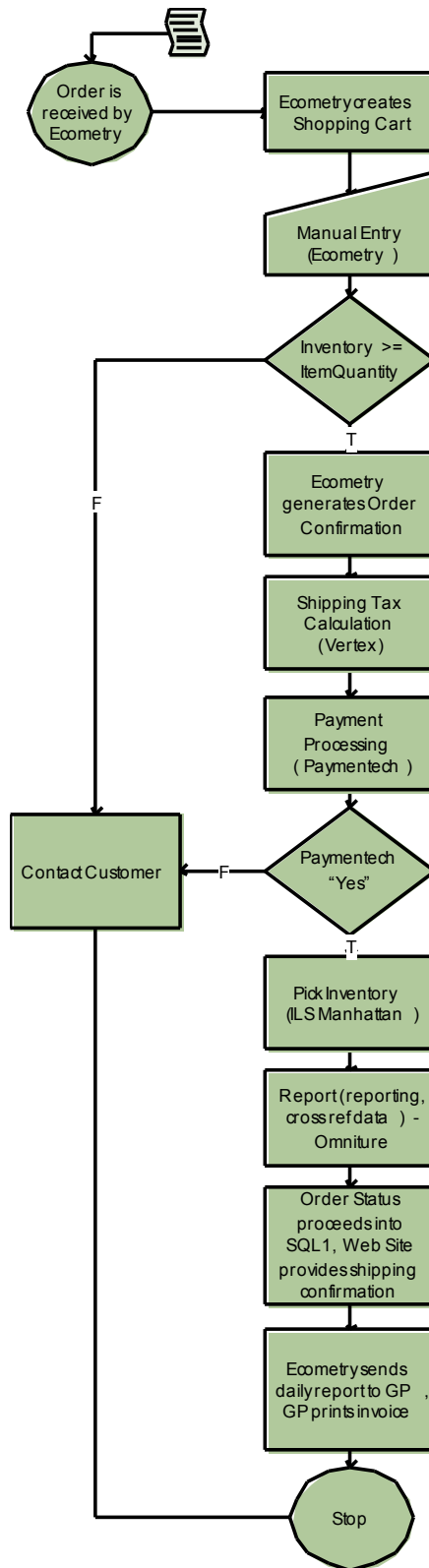


Fig. 5 Order Processing Diagram

| Process | Implementation |
|--|---|
| After customer’s order has been entered into the system, | 1. The workflow is started by an incoming |

| | |
|--|--|
| <p>the order is received by Ecometry, which reads the data and appends an ID number to the order.</p> | <p>XML document; Ecometry creates shopping cart and does real-time CC verification.</p> |
| <p>The order is forwarded to a CSR – customer service representative, who fulfills the order (new orders placed via web site are marked with “held for manager review” in Ecometry; CSR manually changes RA information if it’s necessary). CSR checks a database for the current inventory of the ordered item, according to the item ID, and compares the quantity of items available with the quantity requested.</p> | <ol style="list-style-type: none"> 2. CSR manually changes the RA/CA info 3. CSR checks the inventory (all locations). 4. A decision evaluates whether the inventory is sufficient. |
| <p>If the amount of stock is not sufficient to accommodate the order, the customer receives “backorder notice” on the web site or via phone.</p> | <ol style="list-style-type: none"> 5. An event node waits for an incoming XML message. |
| <p>If customer wants backorder, the order is placed on hold until new inventory arrives. When the system receives notice of new incoming inventory, it repeats step 3 until it can verify that the inventory is sufficient to process the order.</p> | <ol style="list-style-type: none"> 6. An event node waits for an incoming XML document. When the event is triggered, the flow loops back to the inventory-checking task node. |
| <p>If customer doesn’t want backorder, the order would be cancelled</p> | <ol style="list-style-type: none"> 7. CSR sends a confirmation e-mail to the customer 8. The workflow terminates |
| <p>If the inventory is sufficient, Vertex calculates the shipping taxes</p> | <ol style="list-style-type: none"> 9. An XML message is sent to Vertex to calculate shipping taxes |
| <p>Payment system (Paymentech) checks the customer Credit info and processes the payment;</p> | <ol style="list-style-type: none"> 10. An XML message is sent to Paymentech to process payment transactions 11. A decision evaluates whether the response from the Paymentech is “yes” or “no” |
| <p>If the credit check fails, the CSR is assigned the task of contacting the customer to obtain correct credit information, set up credit limit and the process becomes manual from this point on.</p> | <ol style="list-style-type: none"> 12. The task of contacting the customer is assigned to a CSR, and the workflow terminates |
| <p>If the payment is processed, Ecometry generates order confirmation for the customer; the order is forwarded to WMS system (Manhattan ILS)</p> | <ol style="list-style-type: none"> 13. Ecometry generates confirmation e-mail for the customer 14. An XML file is sent to Manhattan ILS |
| <p>Then order is shipped, the system returns the WMS status updates to Ecometry</p> | <ol style="list-style-type: none"> 15. WMS changes flag to “shipped” 16. An XML file is sent to Ecometry |
| <p>Order Status proceeds into SQL1, Web Site provides shipping confirmation</p> | <ol style="list-style-type: none"> 17. An XML file is sent to web site |
| <p>At any point in the transaction before shipping, the order can be cancelled by notification from the customer.</p> | <ol style="list-style-type: none"> 18. An event node waits for an incoming XML message. |

8. Development, Staging and Production Environments

The client has separate development, staging, and production environments (Dev, Stage, Live are 3 physical servers) for managing the ongoing maintenance of the commerce site, with fairly standard testing and publishing procedures in place. They do not use a version control system for code changes.

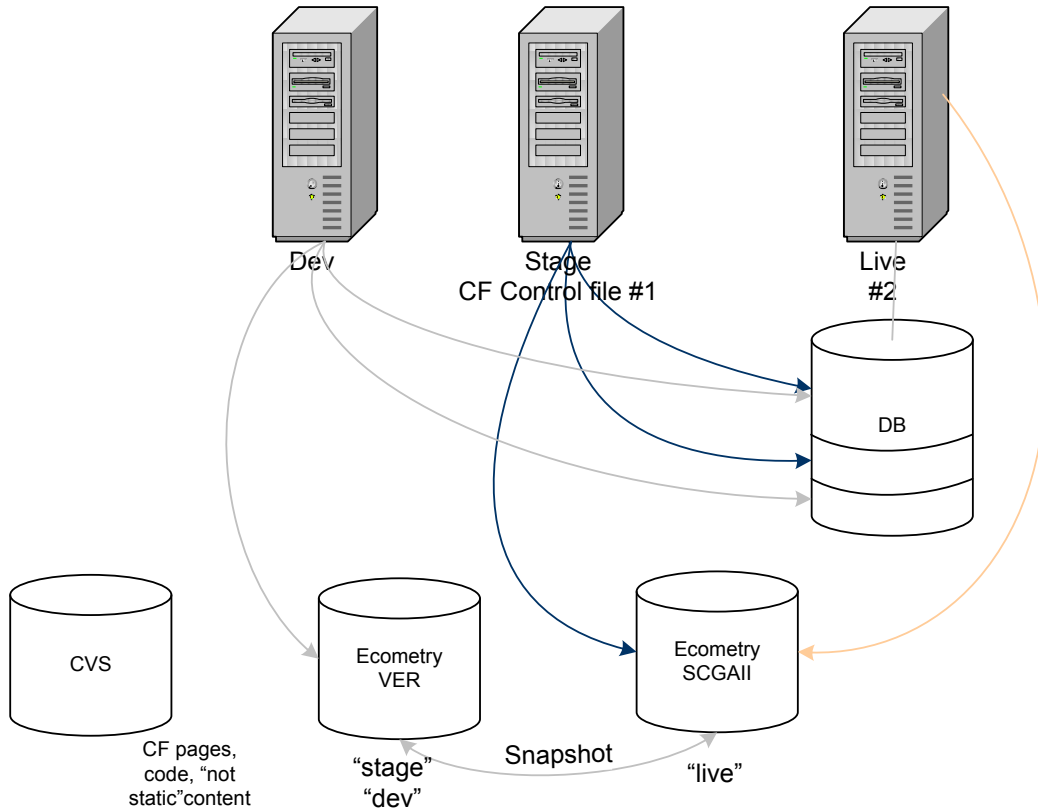


Fig. 6 Production Staging Schema

Staging is used internally. Major (core functional) upgrade will move from development to stage to production. Stage and Live servers point to same instance of Ecometry. Dev can be pointed to different version of Ecometry ("Ver")

Tools: SQL manager/Studio, Cold Fusion Home site, Linux Command Line via SSH
 CVS: Cold Fusion versioning (not static content)

9. Hosting

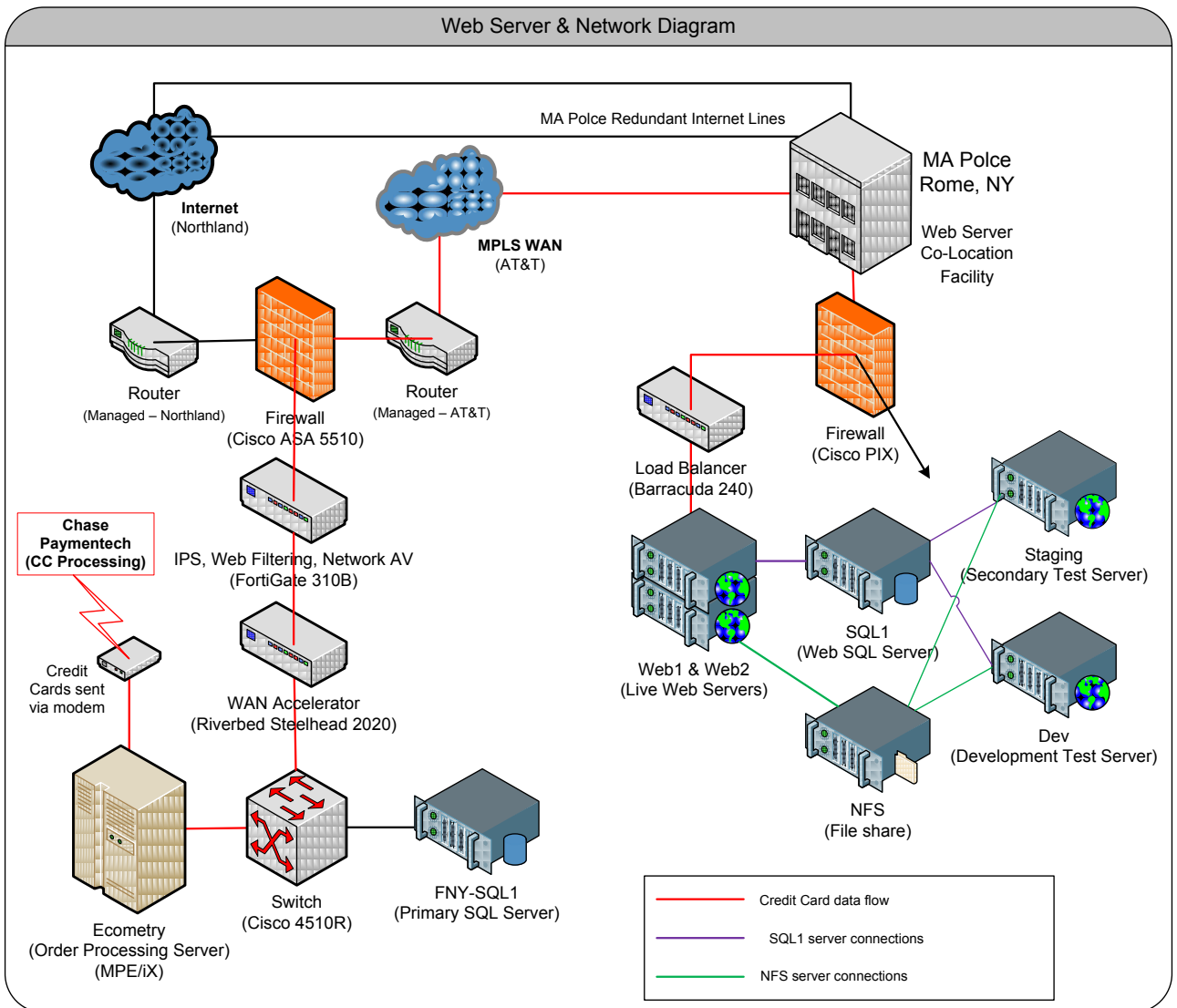


Fig. 7 Web Server & Network Diagram

The client currently uses Alertsite.com for web performance monitoring (alerts regarding network problems; e-Card exceptions)

- Technologies: .NET (C#)
- Browsers: IE, FireFox, Safari
- Web Server : SQL Server 2005
- Cost: 15k a month for hosting
- Back up: manually, initiated by code (CF) at 8PM Eastern time every day; database monitoring , performance(through Omniture, the process is close to approving purchase)
- Up to 50 concurrent DB requests in peak hours
- Host Company limits by 600kbits/sec (or 600kbps).

10. Legacy Issues

The following issues are related to maintaining the customer, product, and order data.

- Data is stored redundantly across different databases and systems; which would be OK for performance reasons if data or referential integrity were enforced, but it is not enforced.
- Major issues in Ecometry: poor performance, no indexing, no constraints to enforce clean data (e.g. a customer may be stored a dozen times, each with a different email address)
- No uniform convention on how data is stored, the same information may be stored in a space-delimited string for the website purposes, and as a human-readable text field for sales people with terminals
- Often, same values are overloaded/overridden/interpreted differently depending on the context; for example – the SKU may be modified by appending a dash with location code to signify where this particular product would be shipped from; SKU gets truncated on the site when shown to the user to omit that part. So, a user orders SKU “12345”, and at fulfillment time, someone manually changes that to SKU “12345-07” because it’s getting shipped from location “07”
- Different ways inventory levels are tracked/updated (regular products vs. discontinued)

Why all this has not presented a major problem yet:

- Relatively low transaction volume/concurrency
- The client does not update inventory in real-time, adding a product to Shopping Cart does not change inventory levels, ordering does (but that update happens as a batch, nightly)
- If a product is ordered but turns out to be not in stock, then it’s treated as a back-ordered item the client only does (or tries to do) real-time inventory for discontinued products due to their limited quantity; sometimes, due to timing issues, mistakes are made, when a person is allowed to order a discontinued product when it’s not in stock – then an apology email is sent to the user
- People in IT know what’s being updated where, so data consistency is often the result of good human supervision/process, not software or system mechanisms