



Property of WilloWare Incorporated

DS0092
SOP Auto-Fulfillment



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Problem Definition

<i>Problem Definition</i>	CCDA
<p>ACME Co. is a large, international, distributor of jewelry. They are experiencing rapid growth, having 30% growth last year (2007). There are more than 50 people dedicated to data entry and shipping. In addition to there being a high volume of sales transactions, many orders also have a very large number of lines (a 6000 line order is common). Some customers might place a new order every day of the week.</p> <p>All sales Orders start out as a Document Type of ORD. They are using a product from Binary Stream that splits Orders into two documents—and INV (invoice) for lines that could be fulfilled from stock, and a BO (backorder) for all other lines.</p> <p>A second product from Binary Stream is used to combine lines from multiple Backorders into a single backorder, which is then transferred to a new Order Type called BORD, where the line quantities are all Backordered.</p> <p>An automated method is required to fulfill these BORD documents with available inventory, based on several selection criteria and rules about how to apply the available inventory. This will be performed weekly, and would be expected to include about 600 documents with about 50 lines on each document (30,000 lines total).</p> <p>First, ACME needs to be able to establish “caps” on how much inventory is allocated to Sales Orders for each Customer Class. The Customer Classes have a priority, so some Orders would be addressed before others based on the Customer’s Class. For example, if 10,000 units are received, a maximum of 1000 could be allotted to each of five Customer Classes, with the remainder being left as available inventory.</p> <p>Second, ACME needs to be able to establish a “threshold” dollar value, below which documents are not fulfilled. In other words, if the extended price for the lines that need fulfillment is below a specified amount, the order is ignored.</p>	

Third, ACME needs to be able to further restrict the list of possible orders to fulfill based on several additional restriction criteria:

- Document Number
- Document Date
- Customer Number
- Requested Ship Date
- Document Type ID
- Site ID
- Batch ID

Fourth, once the list of target orders is identified using the criteria above, they need to be able to manually include/exclude orders from the list.

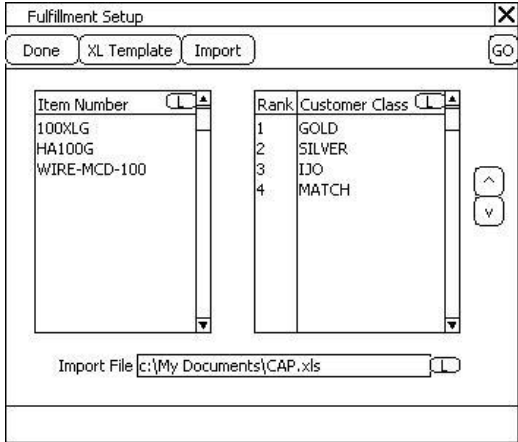

Fifth, ACME needs to be able to manually include/exclude specific order lines from the list.

Sixth, Order fulfillment will then be based on fulfilling the oldest (by Requested Ship Date) documents first, until allocated inventory for each Class reaches its Cap (or available inventory is depleted).

Solution Overview

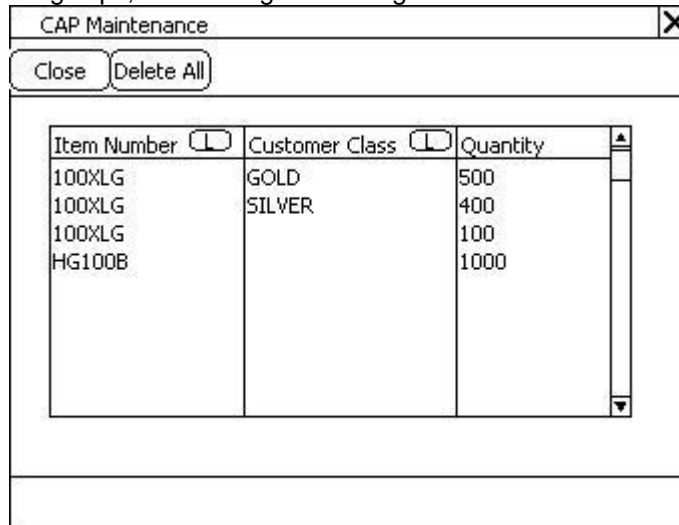
<i>Solution Overview</i>	CCDA
<p>The proposed solution will consist of three parts:</p> <ul style="list-style-type: none"> • Fulfillment Setup • Fulfillment Query • Sales Fulfillment and Sales Fulfillment Detail <p>Fulfillment Setup This window will allow the user to maintain a list of Item Numbers to be fulfilled, and a list of ranked Item Classes. The system will use these two lists to generate an Excel spreadsheet that has Items down the left side, and Customer Classes across the top. The user will enter the distribution caps into the spreadsheet, and save it.</p> <p>The user will then locate that saved spreadsheet and import it. The Distribution Caps will be stored in the SQL database for later use. If the Distribution Caps stay the same from one week to the next, this window could be skipped as the caps would already be defined in the database.</p> <p>Fulfillment Query A “query builder” window will allow the user to create an essentially unlimited set of query restrictions. The query built in the Fulfillment Query window will identify a list of “target” orders that need fulfillment. This list will be displayed in the Automated Sales Fulfillment window.</p> <p>Sales Fulfillment This window will display the list of Sales Orders identified by the Fulfillment Query. The user will be able to Unmark/Mark specific documents in this list, and be able to drill into the document to Unmark/Mark specific lines within that document.</p> <p>When ready to proceed, the user will Process the list of orders, which will fulfill them based on the rules described above.</p>	


Design Features

Fulfillment Setup	CCDA						
<p>Navigation: Tools >> Setup >> Sales >> Fulfillment Setup</p> <p>This window is used to maintain a list of Item Numbers, and Customer Classes. The combination of these two lists is used to generate an Item Number-Customer Class matrix in an Excel Spreadsheet. The user enters "caps" into the spreadsheet, which is then imported back into Dynamics GP.</p>  <p style="text-align: center;">  = Lookup Button </p>							
<table border="1"> <thead> <tr> <th>Field</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Item Number List</td> <td>User can enter item numbers, or select them from the Lookup.</td> </tr> <tr> <td>Customer Class</td> <td>User can enter Customer Classes, or select them from the Lookup.</td> </tr> </tbody> </table>	Field	Function	Item Number List	User can enter item numbers, or select them from the Lookup.	Customer Class	User can enter Customer Classes, or select them from the Lookup.	
Field	Function						
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Customer Class	User can enter Customer Classes, or select them from the Lookup.						

List	The up/down arrows allow the list to be sorted to indicate the Rank (or fulfillment priority) of the Customer Class. Customers in a Rank-1 class would have their orders fulfilled first.
XL Template	The information in this window will be used to generate an Excel spreadsheet with Item Numbers down the left column, and Customer Classes across the top row.
Import	The user will locate the saved spreadsheet (see the Import File field), then click Import. This will read the Item-Customer Class caps into the SQL database. Importing will delete any previously stored Caps.
GO	GoTo button to access CAP Maintenance (see below)

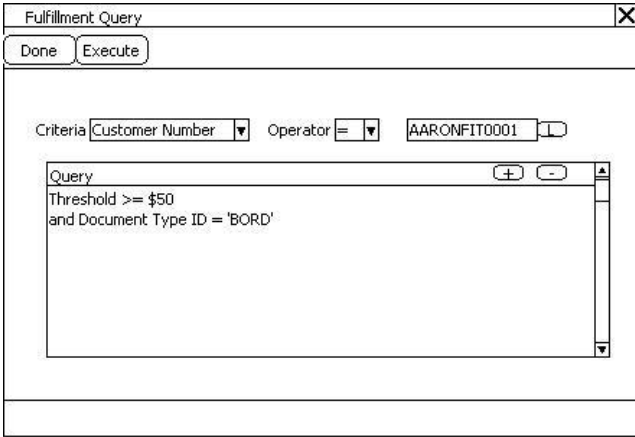

CAP Maintenance is accessed from the GoTo button on Fulfillment Setup. This window allows editing existing caps, and adding or deleting rows.



 = Lookup Button

While the matrix of Item-CustomerClass caps will be imported from a spreadsheet, CAP Maintenance will be used to add Item-only caps.

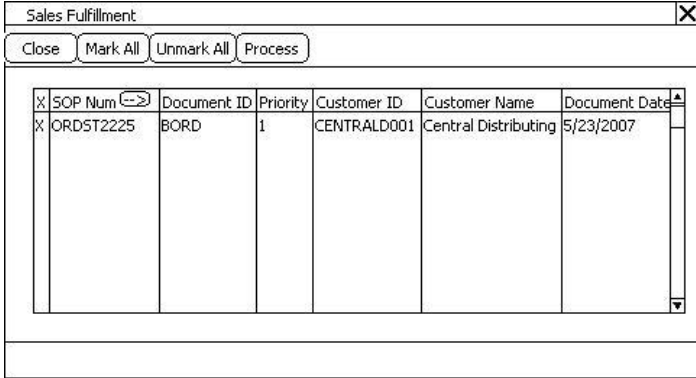

As shown above, 100XLG has caps for the GOLD and SILVER customer classes. In this case inventory would be allocated first to customer classes based on the Customer Class Rank, then inventory would be allocated to any other sales lines up to the Item-only cap of 100. So, 500 would be allocated to GOLD orders first, then 400 to SILVER orders, then 100 to all other orders (see Fulfillment Query for how the selection criteria work).

Fulfillment Query		CCDA			
<p>Navigation: Transactions >> Sales >> Fulfillment Query</p> <p>This window is used to build a restriction query that identifies a set of Sales Orders that need to be fulfilled. An unlimited number of restrictions can be created.</p>  <p> = Lookup Button</p>					
<table border="1"> <thead> <tr> <th>Field</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Criteria</td> <td> <p>A drop-down list containing the criteria that can be used to build a restriction list. The available criteria are:</p> <ul style="list-style-type: none"> • Document Number • Document Date • Customer Number • Requested Ship Date (from Sales Line) • Document Type ID • Batch Number • Site ID (from Sales Line) • Threshold </td> </tr> </tbody> </table>	Field	Function	Criteria	<p>A drop-down list containing the criteria that can be used to build a restriction list. The available criteria are:</p> <ul style="list-style-type: none"> • Document Number • Document Date • Customer Number • Requested Ship Date (from Sales Line) • Document Type ID • Batch Number • Site ID (from Sales Line) • Threshold 	
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	<ul style="list-style-type: none"> • Customer Class <p>Threshold: if Threshold is set at >=\$50, it means that a document must have lines needing fulfillment where the total extended price of the items fulfilled would exceed \$50. The user can specify the dollar amount.</p>	
Operator	<p>A drop-down list containing the types of comparisons that can be done on the selected Criteria:</p> <ul style="list-style-type: none"> • Equals (=) • Less than (<) • Greater than (>) • Less than or equal to (<=) • Greater than or equal to (>=) • Between (enables to “values” field so user can select/enter the from/to values) • Not Equal To (<>) 	
Value	<p>The values fields change depending on the type of Criteria selected. For example, if “Customer Number” “Between” are selected, two “Customer Number” fields and lookups will be enabled. Selecting “Document Date” would enable date fields.</p>	
+ and -	<p>Add or remove a restriction criteria.</p>	
Execute	<p>This is a “button drop list”, which when clicks displays a drop-down menu. At this time the only option will be “Fulfillment Query”. This allows for future uses of this window where the same type of query might be used but for different purposes.</p> <p>Selecting Fulfillment Query performs the query, then opens the Sales Fulfillment window to display the results.</p> <p>In addition to any other criteria, the query will always select only SOP lines that have a Quantity Backordered.</p>	

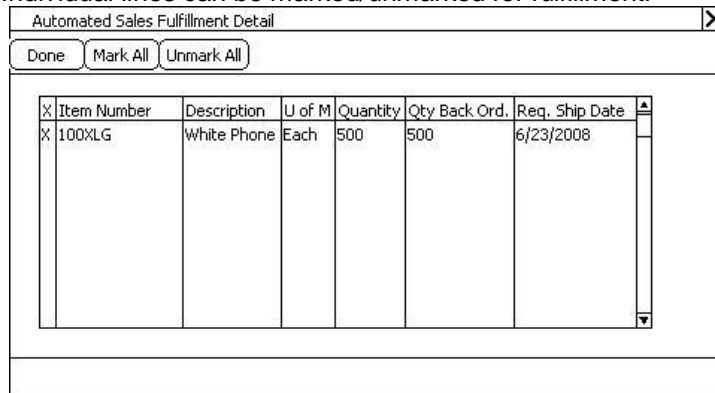


<p>NOTE: this is not a multi-user application. Due to the nature of “fulfilling all sales documents”, by design it must require only one user to be active at any given time. This window will ensure another user does not also have it open. The same applies to the Sales Fulfillment window described below.</p>	
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Sales Fulfillment	CCDA										
<p>Navigation: Opened automatically from Query window. Cannot be opened directly.</p> <p>This window is used to further restrict the documents to be fulfilled by manually marking/unmarking documents. By default, all documents identified by the Query will be Marked.</p>  <p style="text-align: center;">  = Expansion Button </p> <p>This is a Scrolling Window which can have a multi-line display with Expand/Contract buttons.</p> <table border="1"> <thead> <tr> <th>Field</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>"X"</td> <td>This is a Checkbox field used to mark/unmark documents for fulfillment. By default this box will be marked.</td> </tr> <tr> <td>Document No.</td> <td>The column header will be a "zoom" button, which will allow opening the document in Sales Transaction Inquiry Zoom.</td> </tr> <tr> <td>→</td> <td>An expansion button will open the selected document in Automated Sales Fulfillment Detail (below), which allows marking/unmarking specific lines.</td> </tr> <tr> <td>Mark All</td> <td>Marks all documents for fulfillment</td> </tr> </tbody> </table>	Field	Function	"X"	This is a Checkbox field used to mark/unmark documents for fulfillment. By default this box will be marked.	Document No.	The column header will be a "zoom" button, which will allow opening the document in Sales Transaction Inquiry Zoom.	→	An expansion button will open the selected document in Automated Sales Fulfillment Detail (below), which allows marking/unmarking specific lines.	Mark All	Marks all documents for fulfillment	
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Unmark All	Unmarks all documents.
Process	Executes the fulfillment process.
Window Close	When the window is closed, the query results are deleted from the database. In other words, after executing the Query and seeing the results in Sales Fulfillment, you must either Process (fulfill the orders), or close the window (which deletes the query results). It cannot be saved and worked on later, as during that time the underlying Sales Orders could have been changed by another user.

Automated Sales Fulfillment Detail is opened from the SOP Number Expansion button on Automated Sales Fulfillment. This window displays the Line Item Detail for the selected Sales Orders. Individual lines can be marked/unmarked for fulfillment.



This is a Scrolling Window which can have a multi-line display with Expand/Contract buttons.

Fulfillment Process

Both of the Fulfillment windows will ensure that only one user has them open at any given time. Users can be active in other SOP windows, working with sales transactions.

The fulfillment process will attempt to fulfill all lines included in the query. Where inventory is capped (by Item, or by Item-CustomerClass), the amount of inventory allocated to sales

orders will be restricted. Where a cap does not exist for an item, all available inventory will be used if necessary. If inventory runs out, or a cap is reached, before all lines are processed, the fulfillment simply continues to fulfill other items.

The fulfillment process will allocate inventory and fulfill the selected sales lines, making the necessary updates to GP Inventory and GP SOP. Before working with a sales document, the fulfillment process will check if the document is in use by another user. If a document is in use (i.e. it is open in Sales Transaction Entry), the document will be skipped.

Fulfillment will proceed in cycles, starting by processing orders for each Customer Class in order of the Customer Class rank established in Setup. Within each group of orders (selected by Customer Class), the orders will be fulfilled in order of their Requested Ship Date (oldest first), until either the Item-Customer Class cap is reached or all available inventory is consumed.

The process will then be repeated for the next ranked Customer Class, until all Customer Classes have been processed, or all available inventory has been consumed. When a cap is reached, or all available inventory for an item is allocated, the process continues with other items. It does not drive inventory negative.

Once all Ranked Customer Classes have been processed, a final loop addresses "all others". This is the sub-set of SOP Lines identified by the query, but which have not already been processed. Like above, these will be handled in order of Requested Ship Date (SOP Line), and inventory will be allocated until either an Item-Only cap is reached, or all available inventory is allocated.

When finished, the system will print a report showing the Sales Orders and Lines that were included in the Fulfillment, and how much was allocated to each of the included lines.

To maximize performance, this process will be written in tSQL and executed directly on the server (rather than running from the client-side Dynamics GP application).

