Consignment Inventory – A Customized Solution

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Introduction

One method used to achieve higher inventory turns is to utilize a supplier managed consignment inventory program. This paper explains how a customized solution makes consignment inventory transparent to the user; inventory is available for planning and is tracked as a non-asset in the general ledger.

Overview

Consignment inventory is defined as a system that allows the stocking of suppliers' material in the plant stockroom. The supplier maintains ownership of the material until it is picked from the stockroom for production at which time receipt, invoice and purchase price variance is generated. The design of the consignment inventory program is incorporated into a customized bar coding solution for the receipt and storage of raw material and was developed by BPA Systems Inc., a CAI Oracle partner located in Austin, Texas.

In the Automotive Group, we have been using Oracle Financials for many years and in some of our manufacturing facilities we utilize computer aided manufacturing systems on Oracle data bases to track lot and serial numbers. Our system vision is to have one system worldwide, which integrates our business system with our manufacturing systems. We have three domestic sites, our manufacturing facility in Seguin, Texas, a sister manufacturing facility in Elma, New York just outside of Buffalo, and our headquarters office in the Chicago area. Our international manufacturing facilities in Angers, France and Stotfold, England will implement the Oracle manufacturing modules at the end of this year.

In the Seguin, Texas manufacturing facility we build engine controls for passenger cars, light trucks and diesel engines. We run three shifts, five days a week on most of our manufacturing lines and one of our production lines operates seven days a week, 24 hours a day.

We operate with three different SID's, single instances of the data base, each with a computer physically located at each site. We run on IBM S70 computers with Oracle 10.7SC, PROD 16.1 with a Windows NT Operating System.

System Objectives

The project requirements of the supplier consignment inventory program were developed to meet several objectives. No special handling in receiving is required. Consignment material must be transparent to the user. Consignment inventory should be viewable as available as soon as it is put up in the stockroom, is nettable and available for planning, can be valued and can be cycle counted. Suppliers must be notified of consignment activity. The program can be started or ended at any time for any item/supplier, there is no need to buy back or sell back inventory with the start up or conclusion of participation in the consignment inventory program. The item on consignment can be multi-sourced. The supplier identity has to be maintained and inventory must be reconciled by item and supplier. For accounting purposes, consignment inventory needs to be tracked as a non-asset in the general ledger.

Supplier Agreements and Communication

When a supplier agrees to participate in the consignment inventory program, an additional agreement is needed to provide benefits to the supplier. Supplier consignment agreements establish a minimum and maximum level of inventory with a periodic review of average inventory levels. The supplier owns and controls the physical inventory buffer maintained for changes in forecasted demand and therefore has more control over the minimum and maximum levels of inventory. Modified payment terms are also negotiated which provide faster payment when we take ownership of the parts. The supplier must be on ERS, electronic receipt settlement, which eliminates the need for the supplier to send in invoices. The packing slip number is used as the invoice number.

The measurement of on time delivery is changed to reflect stock outs which is measured by the number of times material is pulled to the production floor and inventory is not available. Today most of our suppliers use the Motorola Schedule Sharing™ system. This system provides the supplier with demand for purchased items. This demand is shown in weekly periods, with eight weeks displayed as weekly requirements and then averages weekly demand over a fifty-two week horizon. In Oracle Purchasing, a purchase order or blanket agreement and release is raised for each item that is purchased from a supplier. The purchase order line or release has a large quantity open with a promise date in the future and with the firm flag checked. This provides a line item to receive against without creating supply and exception messages that must be managed. Schedule Sharing™ provides the supplier with the amount of on hand inventory and a minimum and maximum quantity range based on the ABC classification of the part. From this data, the supplier determines the amount to be shipped and when so that the amount of inventory on hand is greater than the minimum quantity and does not exceed the maximum quantity. We instruct our suppliers that they must always cover the backlog and have the first week of demand in transit for receipt during the current week.

To assist the supplier in determining the amount to ship, Schedule Sharing™ also transmits the last five receipt quantities and the date received. When a supplier agrees to participate in the consignment inventory program, the transmission of the last five receipts is no longer accurate enough to reconcile the amount of inventory that they have in our facility. The receipt data transmitted when an item is on consignment reflect the transfer of ownership and occurs when items are moved to a non-consignment subinventory. This movement of items from the stockroom can occur multiple times per day for each item. Therefore, the last five receipts are insufficient for reconciling inventory balances and determining the next ship quantity. The on hand inventory balances transmitted include the material that has been physically received but is held as consignment inventory. The supplier needs to know when the physical receipt of the material is made. For consignment items, an additional communication to the supplier is made that advises when material is physically received. Storing the information on flexfields in the BPA table is generating this information and a BRIO query is run on every Monday and faxed to the supplier. This also allows for our system to provide a detailed reconciliation of the movement of material that is used to settle any discrepancies between our inventory records and the suppliers' records. A future enhancement will make this information available through EDI, electronic data interchange, transmitting an 861 Receiving Advice when material is physically received and an 867, Product Transfer notification for each material issue when transfer of ownership occurs.

System Design - Receiving

When consignment material is received, the receiving dock personnel scan the packing slip information just like any other receipt. They scan the packing slip number, the purchase order number, the quantity and the item number. The system recognizes that the item is on consignment and processes a miscellaneous receipt. The accounting transaction creates a debit to the inventory account. The use of the miscellaneous receipt allows the inventory to be available in the system, without actually transacting the purchase order receipt.

The receipt information is stored on a BPA custom table along with the supplier, the item number, quantity and the date and time of the transaction. When the material is stored in the stockroom, this receipt information is then associated to the locator where the item is stored. This meets the requirement of being transparent to the user, requires no special handling, and inventory is available and used throughout the planning process. The use of this custom table provides other benefits. The supplier identity is maintained. Allows for the random stocking of material and provides an ancillary benefit of better utilization of space. Facilitates the reconciliation of inventory balances by item and supplier and allows for the receipt to be associated to the locator when the item is put away.

When the item is received, the BPA code checks the AutoSource Rules descriptive flexfield segments to determine if the receipt should be routed through Incoming Inspection or delivered direct to the stockroom for put up. The use of the descriptive flexfield in the AutoSource Rules form allow us to meet QS9000 requirements for inspecting items that are not the correct revision level, that require additional written information to be sent with each shipments, and provides for skip lot inspections. If any of these three conditions are not met when the receiver makes the scan, a message is displayed on the hand held unit that indicates the receipt requires inspection. The receiving person scans a bar code label on a plastic cone that we use on our dock to quickly identify parts requiring inspection and provides a visible location where the parts are stored while a sample quantity from the shipment is being inspected. If the material is on consignment, the system generates a Miscellaneous Receipt at this time. In our Oracle set up, the cones are both Receiving Locations and Stock Locators. Because the BPA table stores the receipt number, it allows the Inspector to inspect the part and then make an inspection move, which is also a BPA hand held transaction. The system performs a subinventory transfer from the cone location to the item default subinventory and locator. This is one more way that BPA code has met our requirement that consignment inventory is transparent to the user.

System Design – Stockroom

We utilize random stocking of parts and location control in our raw material stockroom. Therefore it is important to establish material storage criteria. Multiple part numbers can be stored in the same locator. The same part number can be put in a locator if it has the same supplier as the part that is already stored there. If the same part has different suppliers, the new part must be put into a different locator. Consignment items cannot be mixed with non-consignment items of the same item number in the same locator. Consignment items in the same locator with the same part number can have different receipt numbers. An exception exists when a cycle count adjustment causes items that have been paid for to be placed in a single locator. This should be the only exception to the storage criteria.

We utilize a Kanban pull to a work in process subinventory from the raw material stockroom when material is needed for production purposes. BPA designed a Material Pick Request form that is used to request parts from the stockroom. This form requires a Supply Subinventory where the parts will be delivered, the item number, the quantity, a time and a drop location. If the item is an expense item, then an account alias will be required before the next record can be entered. The time is used to determine when parts need to be picked from the warehouse to move to the production floor.

Custom BPA wave pick code provides a paper free system of picking which enforces strict scanning requirements to ensure inventory disposition. The system allows the user to select a list of available inventory picks based on locator and time criteria entered in the Material Pick Request form. The stockroom picker enters the time range and the area within the stockroom zone assigned to him. Using the custom table described earlier, the system will direct the picker to the locator that has the oldest receipt, thereby providing FIFO (first-in, first-out) logic. The stockroom picker scans the locator and the item number and the system displays the quantity to be picked from that locator. The stockroom picker completes the transaction using the hand held device.

When an item on consignment is picked, the transfer of ownership occurs. This satisfies the requirement that consignment inventory be transparent to the user. The picker does not know that a consigned inventory item is being moved. This also meets the requirement that you can turn on consignment inventory for any supplier/item at any time and the system will automatically use up all of the material that is currently owned before it starts to pick consignment material.

Transfer of ownership occurs when inventory is moved to a non-consignment subinventory. This includes a move to a work in process subinventory, which was just described. Other transactions that trigger ownership is when the item is sent to another supplier for outside processing, when a cycle count loss is transacted or an internal transfer occurs. When any of these transactions occur, a miscellaneous issue transaction is processed to the same clearing account used for the miscellaneous receipt. This account is used as a clearing account and the balance in this account represents the value of inventory that is on consignment. In addition, a direct receipt is created, using the information stored in the custom table. The packing slip information is then used by ERS to process payment to the supplier based on the negotiated payment terms in the supplier consignment agreement. The ERS logic requires that a unique packing slip number be created for every receipt in order to avoid duplicate payments to suppliers. The BPA customization attaches a date and time, in seconds, to the packing slip number so that each number becomes unique.

The accounting transactions that occur are a credit to the inventory account as a result of the Miscellaneous Issue, a debit to the inventory account as a result of the Purchase Orders with a debit or credit to the PPV, purchase price variance, account if there is a difference in the purchase price and the standard frozen price.

If material is returned to the stockroom it is treated as a non-consignment item and ownership does not pass back to the supplier. Again, the picking logic developed by BPA controls the issue of this material. It stores this material in a locator and records a zero date in the stockroom. It is not necessary to find the oldest locator where this part is stored. The custom table stores the date information and will direct the picker to that locator first based on the wave pick logic, ensuring that the returned material is moved back to the a work in process subinventory before any other material is picked.

Consignment inventory can be cycle counted under the same guidelines used for any inventory in the stockroom. Because the part numbers and quantities are included in the on hand inventory balance, the items are included in the Cycle Count compile and the rules for cycle counting can be applied to consignment items. If during the cycle count activity a loss is identified and an adjustment is processed, the BPA custom table recognizes that this item, in this locatior, was under consignment and a change in ownership will occur. The system will generate a miscellaneous issue from the receipt information stored, generate the purchase order receipt and send the receipt information to ERS for payment to the supplier. If there is a gain during cycle counting, then it is treated like a return to stock. There is no attempt made to determine if the gain was from a consignment supplier.

Set Up

There is some set up required that is controlled through the use of several descriptive flexfields. We used descriptive flexfields on both the subinventory and locator set up. These flexfields have a segment name of Consignment with a value of Yes or No. The default value on the subinventory table is set to yes. If the subinventory does not store consigned items, then the flexfield value is changed to no. If the subinventory has location control, then a flexfield on the locator form must be also be set up. The name of this segment is Consignment with a value of Yes or No. The default value for the locator table is set to yes.

Add an Account Alias transaction type for Consignment Inventory so that the miscellaneous issue and receipt transactions can be accumulated under one transaction type and can be mapped to the clearing account number.

We are currently running on Oracle 10.7 SC and made extensive use of the flexfields in the AutoSource Rules in order to maintain item/supplier specific information. To meet QS9000 requirements, the revision level of the item received must match the revision level on the purchase order line item or release. A segment of the AutoSource Rules flexfield is used to store the current certified revision level of item and is maintained by the Incoming Inspection operator. At receiving, a lookup is made to the value in this segment and compared to the revision level on the purchase order line or release. If there is a match, the item is delivered to the stockroom, if there is not a match, the receipt is routed to Incoming Inspection. Some items require certification data to be included with the shipment. While this could be maintained at the item level, we choose to include this in the AutoSource Rules flexfield segment because we were already doing the look up to the flexfield segments to determine inspection for item revision and we wanted to simplify the maintenance of data. The second segment is used to determine if data is required with a title of Form Data and a value of yes or no with the default set to no. The third requirement for QS9000 is to provide skip lot inspections. We store in the third segment of the AutoSource Rules flexfield the number of days between skip lot inspections. BPA records the date that the item is inspected, then counts the days against this flexfield value, and when the number of days since the last inspection date exceeds the segment value, the next receipt is routed to Incoming Inspection.

Also stored in the AutoSource Rules form is Schedule Sharing™ information. The code that is used to calculate the minimum and maximum values transmitted to suppliers is stored in one of the flexfield segments.

Another segment is used to identify that the supplier/item is on consignment. This is controlled with a segment titled Consignment with a value of yes or no. The default value is set to no. When this value is changed to yes, the next receipt becomes consignment. This allows for consignment and non-consignment inventory from the same supplier to be stored in the same subinventory. It also allows for the program to be started at any time, for any supplier, even if the item is multi-sourced. This also meets the objective of avoiding any buy back or sell back of inventory at the start or conclusion of participation in the consignment inventory program.

Reports

Several custom reports needed to be developed to support supplier consigned inventory. These were developed using BRIO Query.

An All Items On Consignment Report based on the AutoSource Rule descriptive flexfield Consignment = Yes. Details include the item numbers and the corresponding supplier name, buyer, planner, and the product name that is stored as an item category.

A Consignment Report query was developed which produces multiple sorts for consignment inventory items with a receipt where consignment equals yes. The Consignment Report by Item Number identifies all items in inventory and includes in the detail section the supplier name, the quantity on hand, the subinventory and locator, the receipt date, the receipt number and the purchase order number. There is a sort by Buyer that has the same detailed information as the item sort with the added information of buyer name and totals the value of the inventory for each buyer as well a grand total of the value of all consignment inventory. The value is calculated based on the purchase order price. Another sort is by Supplier that includes in the detail the supplier name, the item number and the value at the purchase order price and the grand total of all inventory on consignment.

A Consignment Summary Report for items received on consignment. The sort is by Supplier. Details include the item numbers and their value at the purchase order price and the total value of the supplier.

A report similar to the Inventory Value Report includes the inventory value of consignment inventory only, Motorola owned inventory and the total value to be used by Cost Accounting to properly value and reconcile Motorola inventory. The inventory value used in this report is the standard frozen cost.

A detailed Reconciliation Report that is used by Cost Accounting and used for reconciliation with the supplier for any discrepancies between our transmitted inventory balances and their records. This report shows transaction history for a given period of time (date/time). The sort is by item number, supplier name and date and includes in the detail section all transactions that occur as a result of moving an item from a consignment controlled subinventory to a non-consignment subinventory including the quantity and value for the miscellaneous issue for a specific account number, the purchase order receipt and the subinventory transfers (from and to subinventorires).

The transaction history of an item includes the debit to the inventory balance account when the miscellaneous receipt is made at the time a consignment item is physically placed into inventory. At the end of the month, a manual journal entry is made to subtract the balance in this account from the inventory value balance sheet account. The modified Inventory Value Report is used to verify that the balance in the clearing account matches the value shown in consignment inventory. When the item is moved to the non-consignment subinventory, the miscellaneous issue creates a credit to the inventory balance account and processes a purchase order receipt. Any PPV, purchase price variance, will be recognized at this time, creating a debit or credit to the PPV account and the value at frozen standard cost will a create a debit to the inventory balance account.

Summary

By incorporating the consignment inventory requirements with the custom code developed by BPA System, we were able to meet all of the objectives of the consignment inventory program. We did not need to modify any of our receiving logic for consignment inventory and the AutoSource Rules are used to control the movement of items into incoming inspection or direct delivery to the stockroom and to control whether or not an item for a particular supplier is on the consignment program. No special handling in receiving is required. The movement of consignment material is be transparent to the user. The program can be started or ended at any time for any item/supplier and there is no need to buy back or sell back inventory with the start up or conclusion of participation in the consignment inventory program. The item on consignment can be multi-sourced.

Consignment inventory is viewable as available as soon as it is put up in the stockroom because a miscellaneous receipt transaction is processed. This inventory is then nettable and available for planning, it is valued at standard frozen cost and can be cycle counted.

Suppliers are notified of consignment activity, both the physical receipt of the inventory and the change in ownership when the material is moved to a non-consginment subinventory. The supplier identity and locator information is maintained on custom tables and reports are used to reconcile any inventory discrepancies.

For accounting purposes, a manual journal entry is required at month end close to remove the value of consignment inventory from the balance sheet account. All receipt and purchase price variance information is captured when ownership of the material is transferred.