

# Oracle Manufacturing from a financial perspective.

Alec Streltsov

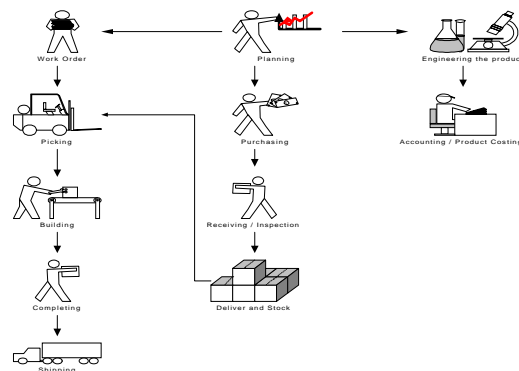
*EXOR Sapient's ERP Division*

## Introduction

The purpose of this paper is to help Oracle Manufacturing users compare the most generic manufacturing processes to the accounting transactions they generate. We will see where the accounts are set up by Application and Form, review the product costing, analyze the transactions and discuss the best practices for the accounting period end close. This paper is restricted to a standard costing environment in discrete manufacturing. The screen shots and navigation paths are taken from 10.7 NCA, but most of the functionality that will be discussed is applicable to the earlier versions of Oracle Applications as well.

## Manufacturing process flow

The typical discrete manufacturing process flow in a standard costing environment will look like this:



First we analyze the market and decide what is the demand. Then we design and engineer the product (set up bill of materials and routing). Define cost of the components and roll up assembly costs. Create master demand schedule (MDS) based on open Sales Orders (SO), sales forecast, inventory on hand, open Purchase Orders (PO) and open Work Orders (WO). Generate Material Requirements Planning (MRP) and Master Production Schedule (MPS), which will suggest PO requisitions and schedule WO for us. Then we will start buying the components from the vendors, receiving and inspecting them. If the components are good, we will deliver them into stock locators within the sub-inventories, if not we can either return them to the vendors or scrap them. The next process is to release scheduled WO and generate a pick list. Based on that document the picker will collect the necessary components from the stock room and deliver them to the production line. The shop floor people will transact the WO and complete it into the locator in the completion sub-inventory. The product will be shipped from that locator against a corresponding SO. The beauty of Oracle is that while people are making manufacturing transactions, the system calculates and tracks the value of these transactions. For example, when we push material to the job, we credit Sub-inventory account and debit WIP class account. In order to understand how these transactions are generated we need to review account set up by application.

## Accounts set up by application

In Oracle General Ledger we set up our basic financial rules. We define sets of books (chart of accounts, calendar, currency), the structure of key accounting flexfield, cross-validation rules, segment security and code combinations. The structure of the key accounting flexfield tells us how many segments we will have in our account and the sequence of these segments. Also we assign flexfield qualifiers (balancing segment, cost center and natural account) to the segments. The cross-validation rules prevent generation of 'bad' code combinations. The segment security rules restrict the responsibility from transacting certain code combinations. Also in General Ledger we can set up account aliases, which help us to speed up data entry.

In Oracle Inventory at the organization parameters form we choose costing organization and costing method, set up default inventory valuation accounts, receiving accounts, profit and loss accounts and default inter-organization transfer accounts. In case of multiple inventory organizations, we can set master organization to be our costing organization or each inventory organization can be its own costing organization. If master organization is costing organization, then all the costs will be set in that organization. On the other hand we can have separate item costs in each organization if each inventory organization is its own costing organization. Oracle manufacturing allows two costing methods – standard costing and average costing. The valuation accounts appear as a default when we set up sub-inventories. Receiving accounts consist of Purchase Price Variance (PPV), Invoice Price Variance (IPV), Inventory Accounts Payable Accrual and Encumbrance. Inter-organization transfer accounts are Transfer Credit, PPV, Receivable, Payable and In transit inventory. These accounts appear as a default when we set up inter-organizational transfer structure. Oracle can have unlimited sub-inventories. Each sub-inventory holds five valuation accounts: Material, Material Overhead, Resource, Overhead, Outside Processing. On item level we can set up an individual cost of goods sold, expense and sales account per inventory item.

In Oracle Work In Process each WIP class may have five different valuation and four variance accounts. Similar to sub-inventory valuation accounts are Material, Material Overhead, Resource, Overhead, Outside Processing (OSP). In WIP we can track material, resource, outside processing and overhead variance. Also each WIP class might have a separate standard cost adjustment account.

In Oracle Costing application we set up absorption accounts for resource, outside processing, material overheads and overheads. We can set up variance accounts for resource and outside processing.

Accounting transactions consist of accounts, quantities and values. Before we will talk about accounting transactions let's review product costing.

## Product Costing

Oracle can track item costs by five elements: material cost, material overhead, resource, overheads and outside processing. Each cost element might have unlimited amount of sub-elements. The cost of a 'buy' part usually consists of material and material overheads. The costs of buy parts might be updated multiple ways. By using Oracle mass edit functionality we can update costs based on open PO average, PO receipt average or invoice cost average. Also you can change material and material overhead costs by a fixed rate, percentage and absolute amount. You can limit your update to the certain item category. To check the accuracy of the cost you can run cost type comparison report. The cost of 'make' part may consist of all five cost elements. To roll the cost of a 'make' part you need to have accurate material costs, clean bills of material and routings (ideally they have to be frozen for the time of roll up), the association of departments, resources and overheads have to be set up and you should have an open accounting period. Please note that Oracle will roll only items with based on roll up flag set to

'Yes'. If you make and buy the same part and want to base its cost on the purchase order price just do not set this flag to 'Yes' and enter cost through item cost define form. Oracle rolls cost from top to bottom. Traditionally cost accountants roll cost by level from bottom to the top. You can accomplish it if you will assign levels to the item categories and then roll by category. If your company is operating in multiple inventory organizational environment and you have bills of materials that cross organizational boundaries at different levels you might have to create a custom program that levels the bills and assigns them to the proper item category.

Now since we know where are the accounts set up in Oracle and how to cost the product we can look at the accounting transactions that is generated by manufacturing processes.

## Accounting transactions

When we update standard costs the value of our inventory might go up or down, depending on which way it is going the transaction will look like that:

DR/CR Material  
DR/CR Material Overhead  
DR/CR Resource  
DR/CR OSP  
DR/CR Overhead  
DR/CR Cost Update Adjustment Account

There is no accounting transaction at the time of PO creation, unless we are using encumbrance accounting. When we receive against a PO, the following transaction happens:

DR Receiving at PO price  
CR Inventory AP accrual at PO price

Inspection does not generate an accounting transaction unless we return material to the vendor or scrap it. Return to vendor will reverse the original transaction and accounts payable department will have to generate a credit memo if the vendor invoice has been entered and paid in the system. The scrap transaction will be:

DR Scrap at PO price  
CR Receiving at PO price

If we have material overhead accounts set up and the PO price of the material is different from the standard cost of material the following transaction will take place:

DR Inventory Material at standard cost of material  
CR Receiving at PO Price  
DR/CR Purchase Price Variance (PO Price - Standard Cost of Material)  
DR Inventory Material Overhead  
CR Material Overhead Absorption

When we enter vendor invoice we book the liability and wash out the Inventory A/P Accrual account with the following transaction:

DR Inventory A/P Accrual at PO Price  
CR A/P Trade at Invoice Price  
DR/CR Invoice Price Variance (Invoice -PO Price)

There is no accounting transaction when we move material between different locators within the same sub-inventory. If we move material between the sub-inventories the

corresponding valuation accounts get updated. When we move inventory between different organizations under FOB shipping point assumption we:

DR Inter-org Accounts Receivables (Org 1)  
CR Inventory Material (Org 1)  
CR Inventory Material Overhead (Org 1)  
CR Inventory Resource (Org 1)  
CR Inventory Overhead (Org 1)  
CR Inventory OSP (Org 1)  
DR In-transit (Org 2)  
CR Inter-org Accounts Payables (Org 2)

At the time of receipt we:

DR Receiving (Org 2)  
CR In-transit (Org 2)

There is no accounting transaction when we schedule and release a work order. If we push material to the work order we:

DR WIP Material  
DR WIP Material Overhead  
DR WIP Resource  
DR WIP Outside Processing  
DR WIP Overhead  
CR Inventory Material  
CR Inventory Material Overhead  
CR Inventory Resource  
CR Inventory Outside Processing  
CR Inventory Overhead

Oracle can backflash material to the job in two forms: operational pull and assembly pull. There is no difference in accounting entry, just in timing of the transaction. Under operational pull the transaction occur when the job quantities are at the move step of this operation. Under the assembly pull the transaction occur at the job completion. When we move resources the following accounting transaction happens:

DR WIP Resources at actual cost  
CR Resource absorption at actual cost

Actual cost means that we are using the resource information (usage and rate) from the most recent or chosen routing, which might be different from the standard routing. The same is true for resource overheads. At the time of work order completion the following transaction happens:

DR Inventory Material  
DR Inventory Material Overhead  
DR Inventory Resource  
DR Inventory Outside Processing  
DR Inventory Overhead  
CR WIP Material  
CR WIP Material Overhead  
CR WIP Resource  
CR WIP Outside Processing  
CR WIP Overhead

Oracle is capable of tracking material usage variance, overhead variance, resource rate and efficiency variances. It is a question of how much data you are willing to collect. We realize WIP variances at the time of work order close.

DR/CR WIP Material  
DR/CR WIP Material Variance  
DR/CR WIP Resource  
DR/CR WIP Resource Variance  
DR/CR WIP Outside Processing  
DR/CR WIP Outside Processing Variance  
DR/CR WIP Overhead  
DR/CR WIP Overhead Variance

When we sell our inventory we incur cost and realize revenue. The following transaction happens on the cost side:

DR Cost of Goods Sold (Flexbuilder)  
CR Inventory Material  
CR Inventory Material Overhead  
CR Inventory Resource  
CR Inventory Outside Processing  
CR Inventory Overhead

We can derive Cost of Goods sold account from the item attribute or use a flexbuilder to generate a certain code combination for us.

On the revenue side of sale in Oracle is:

DR Account Receivables  
CR Sales

Both of these accounts are generated by autoaccounting. Autoaccounting automatically creates default accounting flexfields. It can source segment values from the item, transaction type, sales representative and constant.

After we looked at the accounting transactions it is a good time to review the best practices for the period end close.

## Period close procedures

The old proverb says 'Good beginning makes a good ending', so check your beginning balance. Consider adjustment entries and charges to improper accounts. You need to make sure you entered all the transactions in the right period and there is no pending material and WIP transactions. Close the periods in the following order: Payables – Purchasing – Inventory. It is always good to check the material cost transaction manager for uncosted transactions. General Ledger transfers should be performed on the weekly basis, do not wait till the end of the month. At the time of period end close you need to make sure there is nobody in the system making transactions. There is a form in system administration application that monitors active users.