
Product Costing in a Multi-Organization Environment

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Abstract

“How to sequence the rollup, coordinate the costs between organizations, and carry cost element detail in a multi-org environment. Addresses costing issues for items that are internally sourced from “sister” organizations and systematically/practically processes the rollup.”

After reading this paper, you will have some excellent techniques to conquer the beast that is multi-org costing. The goal of this paper is to illustrate these techniques in a blunt and straightforward fashion. You will see your own situation somewhere within this paper. Although we are focusing on a specific problem caused by convoluted relationships between organizations, single organization users will definitely benefit too. You will learn:

- Programmatic rollup by “level”
- How to breakdown cost into more detail than simply “material”
- Material overhead: absorption upon delivery, Yes/No?
- Bottom to top rollup (standard Oracle only provides Top to bottom)

Introduction

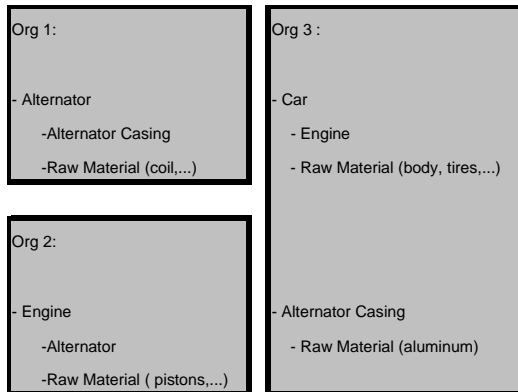
The majority of manufacturing companies use standard costs to value their inventory, calculate and analyze variances, and forecast profit margins. Within the standard cost structure there are two fundamental types, “Buy” and “Make”. Buy items usually have material and material overhead costs. And in addition to material and material overhead, Make items usually have resource, outside processing (OSP) and overhead costs. When the company has more than one plant, Management must direct whether to keep the standards the same, or consistently different by implementing transfer pricing strategy. Oracle performs setting costs in any given organization well, but it falls short if those costs require input into “sister” organizations.

Oracle is restrictive when it comes to setting up costing organizations. There are two options: either to have costing attributes enabled at the item or item/organization level. If costing attributes are set to the item level, the costing organization will be master organization. Costs for all items are only defined in that organization. Also, only in master organization can use Work in Process (WIP). That set up is good for the companies that have one plant and several distribution centers. However, if the company has a several plants and wants each of them to schedule and release work orders, then the costing attributes should be set to the item/organization level. Each inventory organization then becomes its own costing organization. In that situation, costs are defined independently in each inventory organization.

A typical Engineering versus Accounting dilemma might occur. If two plants roll up costs for the same part, these costs probably will not equal. Each plant uses its own resources, rates, and bill of materials (BOMs), to arrive at conflicting costs. Accounting favors assigning a different part number in order to minimize WIP variances. Engineering counters with “Different cost does not change “Form, Fit, or Function” and therefore we will not change the part number”. In that situation, Accounting should base the standard costs on the most representative bill and router. There is nothing wrong with the variance as long as we have a legitimate explanation for it.

The Tangled Web

The problem we faced dealt with a company that had multiple inventory organizations, passing items from one plant to another. One plant builds a subassembly and another plant uses that subassembly as a component on its BOMs. The transfer of items is an integral part of their business process. But, this puts a tremendous load on Cost Accounting to coordinate the timing and direction of the annual cost rollup. Here is an illustration of the way their items were passed between the different organizations.



Org 1 builds alternators, Org 2 makes engines, and Org 3 assembles cars and makes alternator casings. They must address many issues. How to level BOMs that cross-organizational boundaries? Who rolls up their costs first? How to transfer costs to the proper organization without losing the cost element detail? And of course, the quintessential question, “Shouldn’t the system be able to do this for us?”.

Unfortunately, there is no automated solution to this problem in standard Oracle. This hypothetical example is very simplified, imagine thousands of items transferring between plants. The more multi-org BOMs a company has, the less likely Cost Accounting can accomplish the cost roll up manually.

Solution

One of the first things to answer is “Does standard Oracle address this issue?” Within the Cost module, there is a program called “Copy Item Costs Across Organizations” (\ Navigate Cost ItemCost Copy). At first glance, this appears to take care of the problem. However, this program does not really meet the needs of most manufacturing concerns. As this program copies to the other organization, it looks at the cost sub-elements, departments, and activity codes (see the Cost Reference Manual). These must match exactly, or the report “errors out”. This approach might have some use for purchased items, where the sub-elements are few (material & material overhead). But, manufactured items will probably have a wide variety of departments, resources, and activity codes from organization to organization. It’s this variety that effectively makes this approach useless.

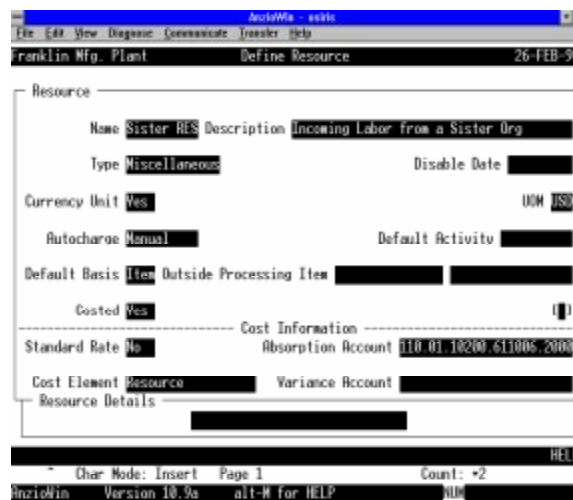
However, the idea of copying costs between organizations is very appealing. But how to achieve this goal? Our methodology was designed to take advantage of standard Oracle where ever possible. Note that most of our technique can be replicated using standard Oracle

manually. Single organization users will benefit from this information too. We have simply automated the procedure for speed and convenience. The keystones of our approach are:

- Sub-elements
 - Set “Currency Unit” to Yes for resource and OSP “dummies”
 - Define other dummy sub-elements to obtain desired detail
- Controlling the sequence
 - Allows rollup by level
 - Chance to edit costs before proceeding
- Copy costs to other orgs

Sub-elements

Although not absolutely required, carrying sub-element detail to the other organizations is desirable. Most people prefer to see the costs of an item from a sister plant as material = \$ 90, material overhead = \$10, resource = \$ 5, and overhead = \$ 45; instead of just material = \$ 150. To achieve this breakdown, there must be a resource and OSP sub-element setup with Currency Unit = Yes (\Navigate BOM Setup Organization Resources). Unlike “ordinary” resources, these appear as a choice in the quickpick list on the “Define Item Costs” form. We will use this dummy as we copy data from an outside organization to our organization.



(\Navigate BOM Setup Organization Resources)

We believe that most people will only require cost element level detail, not sub-element detail. For example, we suggest defining a resource sub-element, such as “Sister Org Resource”, to represent all labor from items sent to your organization from sister

organizations. Should you desire more detail, define additional sub-elements like “Org 2 Resource”, “Org 3 Resource”, “Org 2 CNC Lathe”, “Org 2 CNC Mill”, etc. Establishing resource/OSP sub-elements with Currency Unit = Yes, might also be beneficial for applying labor that does not belong on the router, but Management still wants to include those costs during the rollup procedure.

Controlling the Sequence

This is the core of our solution. Rolling costs by level is vital for multi-inventory organization installations where the organizations transfer items between themselves. Roll by level is a great technique for single organizations too. This allows the chance to review the output before continuing to the next level, correcting errors before compounding the mistakes. We use the standard Oracle process (with a little help) to achieve this goal. One of the options in the rollup process (\ Navigate Cost ItemCost Rollup) is to roll by category. If we can identify a given set, or level, per organization, we can “tag” them with a category, and then roll that level.

We must first identify the lowest level. Typically, this would include manufactured items that use only raw material (Buy items) for level 1 BOM components. Under these transfer conditions, however, identifying an item as a Buy part (i.e. Based on rollup = No) is not sufficient. To distinguish between the different Buy items, we use the terminology External and Internal Buy items. External buys are the typical items provided by an outside vendor. The cost elements for these items are usually material and material overhead. Internal Buys are manufactured items sourced from sister organizations. They probably have cost elements of material, material overhead, resource, and overhead.

Ultimately, it is our responsibility to distinguish between the two types of buy items. Since Internal buys are manufactured items, we can identify them by testing for “Based on rollup = No” and resource/OSP costs are greater than zero. Like any buy part, we can not roll until costs are confirmed, and loaded, from your vendor. The vendor in this case is the sister organization and they are supplying internal buys.

The following details the fundamentals of our approach.

- Test for “control”
- Tag (assign level category)
- Roll by level (using the “by category” option)
- Edit
- Copy (& tag) to other orgs

- Repeat

As with any rollup, the normal BOM, router, and purchased part maintenance must proceed the actual roll process. Our approach requires an additional constraint. There can be only one occurrence, per item, where “Based on rollup = Yes”. This insures that one item drives the cost for all other organizations. The next step is to assign the level category to the items where costs are constants. These typically are limited to purchased items (external buys in our terminology), but there may be some in-house manufactured items that have the Based on Rollup flag set to No because of contractual obligations, or internal requirements.

After Level 0 (Lowest Level)									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE						
1		Alt casing	Internal BUY						
1		R/M	External BUY	0					
2	Engine		MAKE						
2		Alternator	Internal BUY						
2		R/M	External BUY	0					
3	Car		MAKE						
3		Engine	Internal BUY						
3		R/M	External BUY	0					
3	Alt casing		MAKE						
3		R/M	External BUY	0					

After Level 0 (Lowest Level)

Using this tag, we can test our BOMs to see if our organization has “complete control” of those components. The test is essentially this: Is this an external buy? If it is not an External Buy, have we already rolled this manufactured item in the source org? If any component fails the control test, we will not tag that assembly for the next level’s roll. For those assemblies that pass the test, we tag them with a category and roll by category.

After Level 1									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE						
1		Alt casing	Internal BUY						
1		R/M	External BUY	0					
2	Engine		MAKE						
2		Alternator	Internal BUY						
2		R/M	External BUY	0					
3	Car		MAKE						
3		Engine	Internal BUY						
3		R/M	External BUY	0					
3	Alt casing		MAKE		1				
3		R/M	External BUY	0					

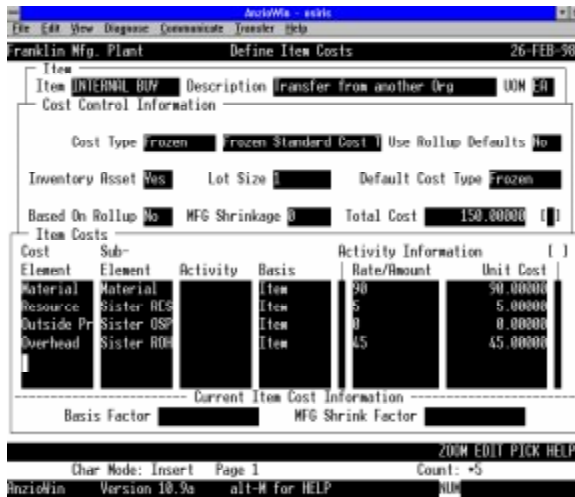
After Level 1

Copy Costs to other Orgs

After Cost Accounting has reviewed that level’s output, another script runs that copies “good” costs that were confirmed in that level’s rollup. The copying is relatively straightforward. Copy cost for a given item

into every organization where those items exist (and is costed). Now is the time to use the special resource/OSP sub-elements defined during setup. To reiterate, we suggest that you only load the information to the cost element level. Therefore, at most, there would be 5 entries per organization. These are material, material overhead, resource, OSP, and overhead. Also note that the basis for these sub-elements is "item".

Material overhead requires special attention. If you do not want your organization to absorb material overhead for handling this incoming shipment from your sister organization, you will need some programming help. With a minor customization, you can load material overhead into the "Previous level" (PL) (cst_item_cost_details.level_type = 2: along with cst_item_cost_details.rollup_source_type = 3). The material overhead cost element is no longer applied through the ItemCost Define form, yet the total cost is still \$ 150.

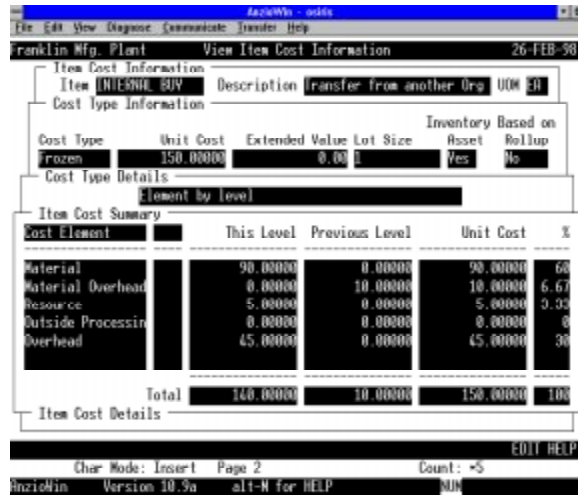


(/ Navigate Cost ItemCost Define)

Material overhead is not charge when these items are stocked, but its value contributes to the item valuation. The system thinks that this material overhead contribution to standard cost came from the BOM/router, like a typical manufactured item. Using the cost inquiry detail of "Element by Level", note that the material overhead is in PL. When this item is



delivered to inventory, material overhead absorption does not occur.



(/Navigate Cost Inquiry Cost Item)

If you desire to charge material overhead, regardless of what "vendor" sent you the items, then load material overhead into the ItemCost Define form. This is same situation as your external buys coming from External vendors.

AutoWise - asist						
Franklin Mfg. Plant Define Item Costs 26-FEB-98						
Item: INTERNAL BUY Description: Transfer from another Org UOM: EA						
Cost Control Information						
Cost Type: Frozen Frozen Standard Cost Use Rollup Defaults: No						
Inventory Asset: Yes Lot Size: 0 Default Cost Type: Frozen						
Based On Rollup: No MFG Shrinkage: 0 Total Cost: 150.00000						
Item Costs						
Cost Element	Sub-Element	Activity	Basis	Rate/Amount	Unit Cost	
Material	Material		Item	50	50.00000	
Material	MATL OHD		Item	10	10.00000	
Resource	Sister RES		Item	5	5.00000	
Outside Pr	Sister OSP		Item	0	0.00000	
Overhead	Sister OH		Item	45	45.00000	
Basis Factor: MFG Shrink Factor:						

(/ Navigate Cost Item Cost Define)

Using the cost inquiry detail of “Element by Level”, note that the material overhead is in TL. When this item is delivered to inventory, material overhead absorption will absorb.

AutoWise - asist						
Franklin Mfg. Plant View Item Cost Information 26-FEB-98						
Item Cost Information						
Item: INTERNAL BUY Description: Transfer from another Org UOM: EA						
Cost Type Information						
Cost Type: Frozen Unit Cost: 150.00000 Extended Value: 0.00000 Lot Size: 0 Asset: Yes Rollup: No						
Cost Type Details						
Element by level						
Item Cost Summary						
Cost Element	This Level	Previous Level	Unit Cost	%		
Material	50.00000	0.00000	50.00000	60		
Material Overhead	10.00000	0.00000	10.00000	6.67		
Resource	5.00000	0.00000	5.00000	3.33		
Outside Processing	0.00000	0.00000	0.00000	0		
Overhead	45.00000	0.00000	45.00000	30		
Total				150.00000	0.00000	150.00000 100
Item Cost Details						

(/Navigate Cost Inquiry Cost Item)

In addition to copying the cost into the other organizations, the program also assigns their level category. With more items marked as “good”, more of the remaining assemblies pass the test as the entire process cycles. The following tables illustrate the progression the rollup at our hypothetical car manufacturer.

After Level 1, Copy & Tag									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE						
1		Alt casing	INTERNAL BUY		1				
1		R/M	EXTERNAL BUY	0					
2	Engine		MAKE						
2		Alternator	INTERNAL BUY						
2		R/M	EXTERNAL BUY	0					
3	Car		MAKE						
3		Engine	INTERNAL BUY						
3		R/M	EXTERNAL BUY	0					
3	Alt casing		MAKE		1				
3		R/M	EXTERNAL BUY	0					

After Level 1, Copy & Tag

After Level 2									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE			2			
1		Alt casing	INTERNAL BUY		1				
1		R/M	EXTERNAL BUY	0					
2	Engine		MAKE						
2		Alternator	INTERNAL BUY						
2		R/M	EXTERNAL BUY	0					
3	Car		MAKE						
3		Engine	INTERNAL BUY						
3		R/M	EXTERNAL BUY	0					
3	Alt casing		MAKE		1				
3		R/M	EXTERNAL BUY	0					

After Level 2

After Level 2, Copy & Tag									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE			2			
1		Alt casing	INTERNAL BUY		1				
1		R/M	EXTERNAL BUY	0					
2	Engine		MAKE						
2		Alternator	INTERNAL BUY			2			
2		R/M	EXTERNAL BUY	0					
3	Car		MAKE						
3		Engine	INTERNAL BUY						
3		R/M	EXTERNAL BUY	0					
3	Alt casing		MAKE		1				
3		R/M	EXTERNAL BUY	0					

After Level 2, Copy & Tag

After Level 3, Copy & Tag									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE			2			
1		Alt casing	INTERNAL BUY		1				
1		R/M	EXTERNAL BUY	0					
2	Engine		MAKE					3	
2		Alternator	INTERNAL BUY			2			
2		R/M	EXTERNAL BUY	0					
3	Car		MAKE						
3		Engine	INTERNAL BUY					3	
3		R/M	EXTERNAL BUY	0					
3	Alt casing		MAKE		1				
3		R/M	EXTERNAL BUY	0					

After Level 3, Copy & Tag

After Level 4 (Highest Level)									
ORG	ASSY	COMP	TYPE	LEVEL					
				0	1	2	3	4	
1	Alternator		MAKE			2			
1		Alt casing	INTERNAL BUY		1				
1		R/M	EXTERNAL BUY	0					
2	Engine		MAKE					3	
2		Alternator	INTERNAL BUY			2			
2		R/M	EXTERNAL BUY	0					
3	Car		MAKE						4
3		Engine	INTERNAL BUY					3	
3		R/M	EXTERNAL BUY	0					
3	Alt casing		MAKE		1				
3		R/M	EXTERNAL BUY	0					

After Level 4

At this point, we have reached the highest level and the rollup is complete. Notice that almost all of this approach could be done manually. All that is required is to identify all of the Internal Buy items and send that organization a request for next year’s costs. Although there might be some cases of “We can’t tell you the cost of the engine until you tell us the cost of the Alt.

casing”; you might get by without a programmatic methodology. Once the latest costs are communicated, like any costs for a Buy item, they must update the “Pending” cost type in the “ItemCost Define” form. After all of these “raw material” costs are in, use the standard Oracle cost rollup. The drawbacks are loss of the bottom up rollup and the huge manual effort to enter cost information in one organization when it already resides on your system under another organization.

Major Benefits:

Here is a quick summary of the techniques that might be beneficial to your operation. If you are just getting started with Oracle, these are the points to remember.

- **Programmatic identification of the candidates to roll by level**
Reliable, systematic mechanics in identifying what, and when, to roll. Relieves personnel of a potentially massive, tedious task
- **Costs breakdown in more detail than simply “material”**
With Currency Unit = Yes, these resource/OSP sub-elements can load into the ItemCost Define form. Even if you ship very few items between organizations, you may use this technique. Simply define those special sub-elements and manually enter them into the Define ItemCost form. Having a resource option on this form might also be worthwhile if you want to collect the labor required to “kit” items before shipment.
- **Material overhead: absorption upon delivery, Yes/No?**
If you desire absorption, then enter this sub-element into the ItemCost Define (all cost entered here are TL) form along with the other sub-elements. To stop this absorption, you need a custom program to change this cost element to PL (cst_item_cost_details.level_type = 2) and also make it appear to have come from the router (cst_item_cost_details.rollup_source_type = 3).
- **Roll by category**
This is the basis of our solution. This concept also drives maintenance capabilities. Currently, Oracle only rolls “top down”. A change in a given subassembly’s cost cannot effectively lead to a revision of the higher level assemblies that use it. But, by combining this concept with an item “where used”, we can identify the items effected by changing this

component’s cost. Once they are identified, it’s a simple matter to roll by category.

- **Automatically copy data that already exists on the system**
Since one organization bears the responsibility of setting the cost of these assemblies, that data eventually resides on the system. Once it exists, it is efficient to have a program copy it to all the user organizations rather than key it manually.

This solution for addressing multi-organization costing is a wonderful combination of standard Oracle and custom programming. Although the program was developed to address a multi-organization rollup, the techniques are useful to the entire Cost Accounting community. We hope this information will serve you well in the coming years.

About the Author

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