

Proposed Average Cost and Landed Cost Calculation Fix in ADempiere

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A. Cost Calculation

Method: Average PO/Invoice

Formula :

$$\text{Current Cost} = \frac{((\text{old Current Cost} * \text{old Current Qty}) + \text{Amt})}{(\text{old Current Qty} + \text{Qty})}$$

Example :

<i>Transaction</i>	<i>Current Cost</i>	<i>Current Qty</i>	<i>Description</i>
Beginning	100	10	
Receipt 10@\$110	105	20	Current Cost = $\frac{((100 * 10) + 1100)}{(10 + 10)}$
Shipment 20	105 (used)	0	When product stock is decrease, current cost is not recalculated.
Receipt 10@\$120	120	10	Current Cost = $\frac{((105 * 0) + 1200)}{(0 + 10)}$
Physical Inventory 10	120	20	Current Cost = $\frac{((120 * 10) + 1200)}{(10 + 10)}$ When product stock is increase, current cost is recalculated.

Fixes:

- 1. Delta Qty and Delta Amt as difference between Old Qty, Old Amt and New Qty, New Amt which used for Adjusting Product Cost**

Location : base/src/org/compiere/model/MCostDetail.java

```
Method : public static boolean createOrder (MActSchema as, int AD_Org_ID,
      int M_Product_ID, int M_AttributeSetInstance_ID,
      int C_OrderLine_ID, int M_CostElement_ID,
      BigDecimal Amt, BigDecimal Qty,
      String Description, String trxName)
```

Line : 76

```
cd.setDeltaAmt (Amt.subtract (cd.getAmt ())) ;
cd.setDeltaQty (Qty.subtract (cd.getQty ())) ;
if (cd.isDelta ())
{
    cd.setProcessed (false) ;
    cd.setAmt (Amt) ;
    cd.setQty (Qty) ;
}
```

We probably need to refactor the codes as the same modification has to be applied also in createInvoice, createShipment, createInventory, createMovement, and createProduction.

Next, Delta Amt & Delta Qty is used to adjust Product Cost

Line : 885

```

if (isDelta())
{
    qty = getDeltaQty();
    amt = getDeltaAmt();
}
else
{
    qty = getQty();
    amt = getAmt();
}

```

This is also to fix bug when MR is partially matched with AP Invoice, at the second match, it always use the first match's Qty & Amt.

2. Product Cost and Cost Detail is re-calculated when Matched PO/Invoice is delete, or AP Invoice is voided.

3. For Average PO, there will be potential cost problem when a PO that has already been matched to MR, is voided/reactivated. A protection in this area may be needed.

B. Landed Cost / Cost Adjustment Calculation

Method: Average

Formula :

$$\text{Current Cost} = \frac{((\text{old Current Cost} * \text{old Current Qty}) + \text{Amt})}{(\text{old Current Qty} + \text{Qty})}$$

$$\text{Landed Cost Amt} = \text{Invoice Amt} / \text{Receipt Qty}$$

Example :

<i>Transaction</i>	<i>Current Cost</i>	<i>Current Qty as denominator</i>	<i>Current Qty product</i>	<i>Description</i>	<i>Cost</i>
Beginning	0	0	10		110
Landed Cost \$10	10	1	10	Current Cost = $\frac{((0*0)+10)}{(0+1)}$	110 +10

<i>Transaction</i>	<i>Current Cost</i>	<i>Current Qty as denominator</i>	<i>Current Qty product</i>	<i>Description</i>	<i>Cost</i>
Landed Cost \$6	8	2	10	Current Cost = $\frac{((10*1)+6)}{(1+1)}$	110 + 8
Shipment 10	8	2	0		110 + 8
Receipt 10@\$120	0	0	10	When new Receipt is received at Zero stock, the COGS is using new Cost and New Landed Cost/Cost Adjustment (Landed Cost is reset to 0).	120 + 0
Landed Cost \$6	6	1	10	Current Cost = $\frac{((0*0)+6)}{(0+1)}$	120 + 6

Fixes:

1. Problem: Landed Cost is just cummulated

http://sourceforge.net/tracker/index.php?func=detail&aid=1435741&group_id=29057&atid=410215

Solution: Landed Cost Calculation / Cost Adjustment is using average calculation regardless which Costing Method is used.

Location : base/src/org/compiere/base/MCostDetail.java

Description : current cost for all non-Material Cost Element is using average method

Current Cost = ((oldCurrentCost * oldCurrentQty) + newAmt)/(oldCurrentQty + newQty)

Method : `private boolean process (MAcctSchema as, MProduct product, MCostElement ce, int Org_ID, int M_ASI_ID)`

Line : 1016

```
BigDecimal cCosts =
cost.getCurrentCostPrice().multiply(cost.getCurrentQty()).add(amt);
BigDecimal cQty = cost.getCurrentQty().add(qty);
if (cQty.signum() != 0)
cCosts = cCosts.divide(cQty, precision, BigDecimal.ROUND_HALF_UP);
```

2. Reset non-Material Cost Element when Current Qty has been empty (ZERO)

Location : base/src/org/compiere/base/MCostDetail.java

Description : Reset Non-Material Cost Element when Current Qty has been empty (ZERO)

Method : `private boolean process (MAcctSchema as, MProduct product, MCostElement ce, int Org_ID, int M_ASI_ID)`

3. Copy Landed Cost Allocation into Reversal Invoice when the invoice is being voided

Location : base/src/org/compiere/model/MInvoiceLine.java

Description : get Landed Cost from Invoice Line and copy from Landed Cost

4. Landed Cost distribution by single product is currently not supported.