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Accounting Techniques: A Dichotomy in Inventory Valuation Differential

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Abstract

This paper focuses on the adaptability of accounting techniques, determination of the effects of using different inventory valuation techniques in pricing mechanism and the resultant effect on organizational profitability. A company wise comparison of accounting records and review of neolithic literature based on accounting techniques, convey absolute clarity of the subject matter. The adaptability of different accounting techniques of inventory pricing mechanism was reviewed to determine the organizational objective, was harnessed to review the adequacy and advantage of different techniques and the differential effects on organizational profitability were carefully studied. Methodology shows that the work on this paper entirely based on neolithic review of accounting literature and techniques adopted in exhibiting the company wise inventory pricing system. It was observed that the effect of using different techniques in pricing inventories will be different on cost per unit of the process.

Keywords: FIFO, Accounting, Dichotomy, Inventory, Valuation

Introduction

When work done in a process includes unfinished units, “equivalent completed units” is determined for work done on unfinished units. A statement of equivalent completed units is prepared. The first part of this statement shows the physical flow of units with the help of “input” and “output” columns. Then output of the process is expressed in terms of “completed units” with regard to stage of completion for each element of cost, i.e. material, labour, and overhead. The following points should be kept in view for preparing statement of equivalent completed units:

- Determination of equivalent completed units” for work done on unfinished units in closing stock, the state of completion with regard to different elements of cost is kept in view.

- Determination of equivalent completed units” for work done on unfinished units representing opening stock, following two points should be noted:

- Equivalent completed units are determined for work done for bringing the units from given stage to the stage of completion. It is supposed for the sake of example that 100 unfinished units representing opening stock is 75% complete with regard to material. These units are completed in the process during the period under consideration. In the above case, equivalent completed units is determined for work done on 100 units for completing them to

the extent of 25% with regard to material (these units are already 75% complete with regard to material).

○ Unfinished units representing opening stock should not bear the cost transferred to the process with newly introduced units. To obviate this difficulty, units completed in the process is divided into two categories:

○ Unfinished units representing opening stock should not bear the cost transferred to the process with newly introduced units. These units should bear the proportionate material cost relating to the process. For this reason, two columns - material 1 and material 11 – are used in the statement of equivalent production. Column “material 1 represents the units which bears the cost transferred to the process. The units representing opening stock and partly finished units should not appear in this column since they are complete as the cost transferred to the process is concerned.

○ Units, which are newly transferred to the process, should bear both the cost transferred to the process as well as material cost relating to the process. These units will appear in both the columns (material 1 and material 11). Therefore, column “material 11” in the statement of equivalent production should include:

- Units equal to work done on opening stock.
- Units introduced and completed and;
- Units equal to work done on closing stock.

Equivalent completed units are not found out for normal loss, because it is shared by good production in the process.

Units representing abnormal loss are treated like “units finished and transferred to the next process” for the purpose of preparing statement of equivalent completed units in the production.

Units representing abnormal gain are treated like “units finished and transferred to the next process” for the purpose of preparing statement of equivalent production.

Neolithic Literature Review: A process is an organizational entity or section of the firm, in which specific and repetitive work is done. A process can also be referred to as the sub-unit of an organization specifically defined for cost collection. The sub-unit is concerned with specific operations. In process accounting, particular attention is given to:

- Costs relating to the process, i.e. both direct and indirect cost.
- Period for which cost for the process is collected.
- Completed units produced during the period.
- Incomplete units in the process at the end of the period and;
- Determination of unit cost of the process for the period.

Process accounting represents type of accounting procedure suitable for continuous production in which output of the industry is homogenous. Each unit is processed in the like manner. It is difficult to trace the items of prime cost relating to a particular order, because its identity is lost in production process. It is assumed in process accounting that average pricing technique represents most satisfactory cost per unit (V.K Saxena CD & Vashist, 1994). Cost of production during a particular period is divided by number of units produced during the period to arrive at the cost per unit. (M.Y. Khan & P.K. Jain, 2003). It is presumed that same amount of material, labour and overhead is chargeable to each item produced during the period.

According to Wheldon, "Process accounting is a method of accounting used to ascertain the cost of the product at each process, operation or stage of manufacture, where processes are carried on having one or more of the following features.

- Where the product of one process becomes the material of another process or operation.
- Where there is simultaneous production at one or more processes of different products, with or without by-products.
- Where, during one or more process or operations of series, the products or materials are not distinguishable from one another, as for instance, when finished products differ finally only in shape or form (R.K. Gupta 1987).
- Each plant is divided into distinct process centers each processing a single product.
- The product/units are indistinguishable in process.
- Both the product and the process are standardized.
- The product is processed in a specific sequence of operations.
- Product cost is determined by dividing the aggregate process cost by the output of the process.
- The cost of abnormal loss and work-in-progress are determined on the basis of equivalent units and are credited to the process.

Industries under the case study: The industries that came under the case study include:

- TEXLON NIG. LTD (Spinning and weaving industry) Oshodi Apapa Express Rd Lagos.
- NESTLE NIG. PLC – food processing industry.
- FARMEX MEYER NIG. LTD – Pharmaceutical industry (Km 38, Lagos Abeokuta Rd, Sango-Otta Ogun State).

Data Procurement and Inventory Valuation under Different Techniques

The effect of using FIFO method, LIFO method, and Average method will be different on cost per unit of the process. The following discussion reveals in detail how different inventory valuation method affects process accounting system in each segment of application.

Adaptability of FIFO Method: Under this technique it is presumed that units are completed in the order of introduction to the process. Units at the beginning are completed first. Then newly introduced units are completed. It is only after this; work is done on closing inventory. According to this method, it is assumed that cost incurred is used:

- First to complete the units already in process,
- To complete the newly introduced units,
- The work done to bring closing inventory to given stage of completion.

If units completed are more than units representing opening inventory, it is presumed under FIFO method that all unfinished units in opening inventory have been completed. When FIFO method of inventory valuation is followed, units completed during the period are divided into categories for the purpose of statement of equivalent completed units:

- Work done for completing opening work-in-progress.
- Newly introduced units completed during the process.

Data P: Following information was extracted from the company books under consideration, regarding process "P" for the month of February 2012.

Production Record:	Units
Units in process as procured on 31 st Jan. 2012	4000
(All material used, 25% complete for labour and overhead)	

New units introduced in the process	<u>16,000</u>
Total units processed	<u>20,000</u>
Production report shows the following results:	
Units completed	
14,000	
Units in process on 28 th February, 2012	
All material used, 33 $\frac{1}{3}$ % complete for labour and overhead	6000
Loss in Process	Nil
Cost Record:	
Work-in-process as on Jan. 31, 2012	N
Material	12,000
Labour	2,000
Overhead	2,000
Cost for February, 2012	
Material	51200
Labour	30000
Overhead	<u>30000</u>
Total cost to be accounted for	<u>127,200</u>

- Presuming that FIFO method of inventory valuation is adopted, prepare:
- Statement of equivalent completed units.
- Statement showing cost per unit of each element.
- Statement of apportionment of cost.
- Process account for process P.

Exhibition – P

Process P Period – Feb. 2012

(FIFO Method)

(Physical Flow) Statement of Equivalent Completed Units

INPUT		OUTPUT		EQUIVALENT UNITS			
Particulars	Units	Particulars	Units	Material		Labor and O/h	
				Units	%	Units	%
Op. Stock	400	Units completed	4000	-		3000	75
Units introduced	16000	:					
		a. Work on Op. St.	10,000	10,000	100	10,000	100
		b. New Units completed.	6000	6000	100	2,000	33⅓
	20,000	c. Closing stock	20,000	16,000		15,000	

Statement of Cost for each Element

Element of Cost	Cost	Equivalent units	Cost/Unit
	N		N
Material	51,200	16,000	3.20
Labour	30,000	15,000	2.00
Overhead	30,000	15,000	2.00

Note: Only cost for the period is considered in this statement

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost/Unit	Cost	Total cost
A. Opening WIP	Material	-	-	-	-
	Labour	3000	2.00	6,000	*12,000*
	Overhead	3000	2.00	6,000	
B. Units newly introduced and completed	Material	10,000	3.20	32,000	
	Labour	10,000	2.00	20,000	
	Overhead	6,000	3.20	20,000	
C. Closing-inventory	Material	2,000	2.00	19,200	27,200
	Labour	2,000	2.00	4,000	
	Overhead			4,000	

This is the cost incurred on opening work-in-process during the period

Process P – Account

	Units	Amt		Units	Amt.
Opening Stock	4000	16,000	Finished stock	14,000	100,000*
Units introduced	16000		Closing Stock	6,000	27,200
Material		51,200			
Labour		30,000			
Overhead		30,000			
	20,000	127,200		20,000	127,200

Process P has been credited with an amount of N 100,000

This is determined as:

- | | |
|---|----------|
| 1. Cost already incurred on opening stock | N 16,000 |
| 2. Cost of work done for completing the Op. St. | |
| 12,000 | |
| (Refer to statement of apportionment of cost) | |
| 3. Cost for completing newly introduced units | |
| 72,000 | |

Therefore, cost of units completed and transferred to finished stock 100,000

Adaptability of Average Method: When FIFO method of inventory cost is followed, the following two points are kept in view:

4. Equivalent completed units are determined for work done for completed opening work done for completing opening work-in-process.

5. Equivalent completed units are determined for work done on closing work-in-process. But when AV. Method of inventory accounting is followed, equivalent completed units are not determined of work done for completing opening work-in-process. No distinction is made between units which are partially completed in preceding period and those units which are started and completed during the period. Cost of opening inventory is added element wise to cost incurred during the process and total, arrived at, is divided by total of the following:

6. Units completed during the period.
7. Equivalent completed units for work done on closing inventory.

When Average method of inventory valuation is adopted, following two points should be kept in view:

8. Units completed will not be divided into two categories (i.e. opening inventory and newly introduced and completed units) as is done in FIFO method.

9. Cost of opening work in process, i.e. cost incurred on opening work-in-process in preceding period, is added element wise with cost incurred during the period.

DATA P: Recalled From FIFO Adoption: Data extracted, regarding process “P” for the month of February 2012.

Production Record:	Units
Units in process as procured on 31 st Jan. 2012 (All material used, 25% complete for labour and overhead)	4000
New units introduced in the process	<u>16,000</u>
Total units processed	<u>20,000</u>
Production report shows the following results:	
Units completed 14,000	
Units in process on 28 th February, 2012 All material used, 33 $\frac{1}{3}$ % complete for labour and overhead	6000
Loss in Process	Nil
Cost Record:	
Work-in-process as on Jan. 31, 2012	N
Material	12,000
Labour	2,000
Overhead	2,000
Cost for February, 2012	
Material	51200
Labour	30000
Overhead	<u>30000</u>
Total cost to be accounted for	<u>127,200</u>

Assuming that AV. Method of inventory valuation is adopted, prepare:

- Statement of equivalent completed units.
- Statement showing cost per unit of each element.
- Statement of apportionment of cost.
- Process account for process P.

Exhibition – P

Process P

Period – Feb. 2012

(AV. Method)

Output: 10,000 units

(Physical Flow) Statement of Equivalent Completed Units

Statement of Cost for each Element

Element of Cost	Cost of Op. WIP	Cost in Process	Total Cost	Equivalent Production	Cost/Units
	N	N	N	N	N
Material	12,200	51,200	63,200	20,000	3.16
Labour	2000	30,000	32,000	16,000	2.00
Overhead	2000	30,000	32,000	16,000	2.00

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost/Unit	Cost	Total cost
Units completed	Material	14000	3.16	44,240	100,240
	Labour	14000	2.00	28,000	
	Overhead	14000	2.00	28,000	
Closing— inventory	Material	6000	3.16	18,960	26,960
	Labour	2000	2.00		
	Overhead	2000	2.00		

Process P – Account

INPUT		OUTPUT		EQUIVALENT UNITS					
Particulars	Units	Particulars	Units	Material		Labor		Overhead	
				Units	%	Units	%	Units	%
Op. Stock	4000	Units completed	14000	14,000	100	14000	100	1400	100
New Units introduced	16000	Closing stock	6000	6000	100	2000	33%	2000	33%
	20,000		20,000	16,000		16,000		16000	

Particulars	Units	Amt	Particulars	Units	Amt.
		₹			₹
3. Opening Stock	4000	16,000	• Units completed and transferred	14,000	100,240
4. New Units introduced	16000		• Closing Stock	6,000	26,960
Material		51,200			
Labour		30,000			
Overhead		30,000			
	20,000	127,200		20,000	127,200

Adaptability of LIFO Method: referred to as “Last-in first-out” of inventory pricing presumed that cost incurred is used:

- First to complete newly introduced units and;
- Then, to complete units already in process.

If there is closing work in process, it is assumed in LIFO method that units which represent opening inventory, remain in the closing work-in process at the end of the period, because units representing opening inventory are attended to at the end of the period. If units under closing inventory are more than units under opening inventory, it is assumed that all units, which represented opening work in process, remain in closing work-in-process at the end of the period.

Note: Under FIFO, work completed is divided into two categories:

- Units lying under opening work in process but completed during the period and;
- Newly introduced units completed during the period.

Under LIFO, closing inventory is divided into two categories:

- Units, which represent opening work-in-process but are lying under closing work in process at the end of the period.
- Newly introduced units lying in closing stock.

DATA Q: Extracted from company under survey, regarding process "Q" for the corresponding month of February, 2011 of the previous year preceding 2012. Following information was available regarding process 'Q' for the month of February 2011:

Production Record:

Units in process as on 31st Jan. 2011

16,000

(All material used, 50% complete for labour and overhead)

Net units started in process

20,000

Total units processed

30,000

Production report shows the following results for the period:

Units completed

15,000

Units in process on 28th February, 2011

15,000

(All material used, 50% complete regarding labour and overhead)

Loss in Process

Nil

Cost Record:

WIP as on Jan. 31, 2011:

N

Material

3,600

Labour

3,900

Overhead

3,900

Cost for February, 2011:

Material

14,400

Labour

31,150

Overhead

31,150

88,100

Presuming that LIFO method adoption is used, prepare:

- Statement of equivalent completed units.
- Statement of cost for each element
- Statement of apportionment of cost.
- Statement of Process 'Q' Account.

Exhibition – Q

Process Q

(LIFO Method)

Period – Feb. 2011

Output: 15,000 units

INPUT		OUTPUT		EQUIVALENT UNITS					
Particulars	Units	Particulars	Units	Material		Labor		Overhead	
				Units	%	Units	%	Units	%
Op. Stock	10,000	Units completed:	15000	15,000	100	15000	100	15000	100
New Units introduced	20,000	Closing Inventory:		-	-	-	-	-	-
		i) Work on Op. WIP		10,000*	-	-	-	-	-
		ii) New Units	5,000	5000	100	2,500	50	2500	50
	30,000		30,000	20,000		17,500		17500	

Statement of Equivalent Completed Units

Statement of Cost for each Element

Element of Cost	Cost of Process	Equivalent units	Cost/Unit
	₹	₹	₹
Material	14,400	20,000	0.72
Labour	31,150	17,500	1.78
Overhead	31,150	17,500	1.78
	76,700		

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost/Unit	Cost	Total cost
			₹	₹	₹
Units completed	Material	15000	0.72	10,800	64,200
	Labour	15000	0.78	26,700	
	Overhead	15000	1.78	26,700	
Closing–inventory Opening WIP	Material	-	1.72	-	-
	Labour	-	1.78	-	
	Overhead	-	1.78	-	
New Units	Material	5000	0.72	-	12,500
	Labour	2500	1.78	3,600	
	Overhead	2500	1.78	4,450	
				4,450	76,700

Process Q – Account

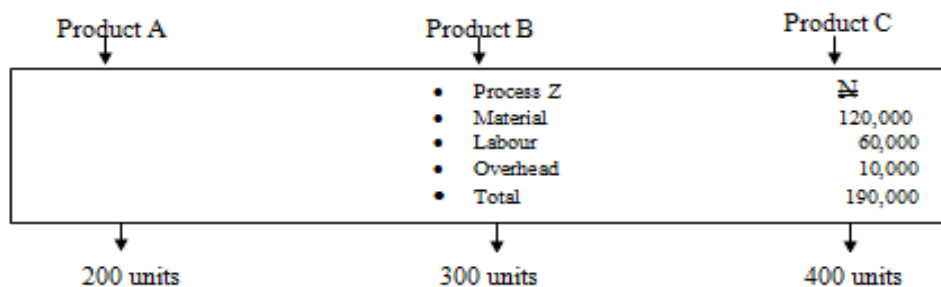
Particulars	Units	Amt	Particulars	Units	Amt.
Opening WIP	10,000	₹ 11,400	Units completed	15,000	₹ 64,200
New Units introduced	20,000		Closing Stock	15,000	23,900
Material		14,400			
Labour		31,150			
Overhead		31,150			
	30,000	88,100		30,000	88,100

Note Process account has been credit with the value of closing inventory of N23,900 calculated as:

• Cost of opening WIP:	₹	₹	
	3600		Material
	3900		Labour
11,400	<u>3900</u>		Overhead
• Cost of work done on Op. WIP		Nil	
• Cost of work done on new units introduced		<u>12,500</u>	
(Refer to statement of apportionment of cost)		<u>23,900</u>	

Adaptability of Weighted Average Method (WAM):

When two or more products are manufactured in the same process and the production of the process consists of dissimilar products, WAM is applied to determine the production cost and the valuation of inventory. For example, the information procured for the month of June 2012 shows:



It is clear from the above procured DATA that total cost relating to process Z has produced 200 units of A, 300 units of B and 400 units of C. The cost relating to the process cannot be divided by 900 units to arrive at the cost per unit, because product A, product B and Product C are dissimilar products. A difficulty arises to express output by one denominator, so that cost relating to the process is divided by it.

When dissimilar products are manufactured, mutual relationship of these products is expressed with regard to that process. This is done by expressing the relative importance of one with regard to others after technical assessment of each type of product. This relative importance of different products with regard to a particular process is expressed by weightage which can be in the form of points.

Suppose the Following Information is Procured:

Product A, product B and Product C pass through a process Z and the following information is given regarding relative importance of each product with regard to process Z and output of process Z.

Type	Points	Output (units)	Total Points
A	2	200	400
B	1	300	300
C	2	400	<u>1200</u>
			1900

₦

Cost Data:

Material	12,000
Labour	6,000
Overhead	1,000
	<u>N19,000</u>

In the above situation, cost of ₦ 19000 can be divided in total number of points, i.e 1900. This gives the cost relating to one point. The cost relating to each type of product can be determined without difficulty on the basis of points relating to that product. When dissimilar products are manufactured, technique of expressing the output in terms of points should be adopted in order to determine a common denominator with which cost relating to that process is divided. The procedure should be:

- Statement of weighted average production should be prepared. Under this statement output of each product is expressed in terms of points.
- Cost of each type of product is computed on the basis of points.

DATA X: Texlon Nigeria Ltd produce three category of fabrics grades – A, B and C, which pass through process I, process II and process III respectively. The following statement shows related importance of each product in each process.

	Process I Points	Process II Points	Process III Points
Product A	3	2	3
Product B	1	1	2
Product C	2	3	1

Cost details for each process for the month of August 2012 are as follows: (In Millions).

Total	Process I	Process II	Process III
	₦	₦	₦
Material	800	1100	600
2500			
Labour	800	1100	300
2200			
Overhead	1000	1100	500
2600			

Total	2600	3300	1400
7300			

Production during the month was as follows:

Product A	300 units
Product B	200 units
Product C	100 units

Prepare:

- Statement of weighted average production
- Statement showing cost of each type of product.

Exhibition X

Period: August 2012

Process X

(Weighted Av. Method)

Output:

Product A 300 Units

Product A 200 units

Product C 100 units

Statement of Weighted Average Production

Products	Production Units	Weighted Production Points			
		Process I	Process II	Process III	Total
A	300	900	600	900	2400
B	200	200	200	400	800
C	100	200	300	100	600
Total	600	1300	1100	1400	3800

Statement of Cost for each type of Product

	Items	Process			Total ₺	Production Units	Total ₺
		I	II	III			
1.	Total cost in each process	2600	33000	14000			73,000
2.	To points in cost process	1,300	1,100	1,400			
3.	Cost/point (1÷2)	20	30	10			
4.	Weighted for one unit of product A (in point)	3	2	3			
5.	Unit cost of product A	60	60	30	150	300	45,000
6.	Weightage for one unit of product B (units)	1	1	2			
7.	Unit cost of product B	20	30	20	70	200	14,000
8.	Weightage for one unit of product C (units)	2	3	1			
9.	Unit cost of product C	40	90	10	140	100	14,000
	Total process cost during the period						73,000

Material Introduced at Different Stages of Production

Material can be introduced in a process at the following stages:

- At the beginning of a process

- At the end of a process.
- At a particular stage and;
- Continuously throughout the process.

Mode of introducing material in a process will significantly affect process accounting and the valuation of inventory. The following points explain preparation of statement of equivalent production, when material is introduced at different stages of production:

- When material is introduced at the beginning of a process, units representing opening stock will not bear the cost of material.

This cost will be shared by the units introduced and completed and units representing closing stock.

- When material is introduced at the End of a process and FIFO method is followed, material cost is distributed among units representing opening stock and units introduced and completed. Units representing closing stock will not bear the cost of material.

- When material is introduced at a particular stage, units under opening stock and closing stock will bear the cost of material according to stage of completion.

Suppose, material is introduced at 30% stage of processing, opening stock is 20% complete and closing stock is 50% complete. In this case, both units in opening and closing stock will bear the cost of material.

- When material is constantly introduced into a process, cost of material is distributed like labour and overhead on the basis of stage of completion.

Opening stock (according to equivalent completed units for work done on it).

Units introduced and completed.

Closing stock (according to equivalent completed units for work done on it).

DATA Z: Information available regarding process Z of NESTLE NIG. PLC for the month of December 2011:

Production Record	Units
Units in process on 30 th Nov. 2011 (50% complete)	10,000
Newly introduced in process during the month	
<u>20,000</u>	
<u>30,000</u>	
Production report shows the following results:	
Units completed	
25,000	
Units in process on 31 st Dec. 2011 (80% complete)	5000
Loss in process	<u>Nil</u>
	<u>30,000</u>

Cost Record:

WIP as on 1 st Dec., 2011:	N
Material	3,600
Labour	5,000
Overhead	2,800
Cost for Dec. 2011:	
Material	7,200
Labour	16,000
Overhead	<u>15,200</u>
Total cost to be accounted for	<u>49,800</u>

The NESTLE NIG. PLC follows FIFO method of inventory valuation, prepare:

INPUT		OUTPUT		EQUIVALENT COMPLETED UNITS					
Details	Units	Details	Units	Material		Labor		Overhead	
				Units	Stage of completion %	Units	Stage of completion %	Units	Stage of completion %
<ul style="list-style-type: none"> Op. Stock Introduced 	10,000	<ul style="list-style-type: none"> Completed: Work on Op. Stock Units-introduced and completed CL. Stock 	10,000	5000	50	5000	50	5000	50
	20,000		15,000	15,000	100	15000	100	15000	100
			5000	4,000	80	4000	80	4000	80
	30,000		30,000	24,000		24,000		24000	

Statement of Cost for each Element

Element of Cost	Cost	Equivalent Completed units	Cost/Unit
	₹	Units	₹
Material	7,200	20,000	0.30
Labour	16,000	24,000	0.67
Overhead	15,200	24,000	0.63
	38,400		

Statement of Apportionment of Cost

Items	Elements	Equivalent completed units	Cost/Unit	Cost	Total	
			₹	₹	₹	
Op. Stock	Material	5000	0.30	1,500	8,000	
	Labour	5000	0.67	3,350		
	Overhead	5000	0.63	3,150		
Units (introduced and completed)	Material	15000	0.30	4,500	24,000	
	Labour	15000	0.67			
	Overhead	15000	0.63			
Closing-stock	Material	4000	0.30	9,450		6,400
	Labour	4000	0.67	1,200		
	Overhead	4000	0.63	2,680		
				2,520	38,400	

Process Z – Account

Details	Units	Amt	Details	Units	Amt.
• Opening Stock	10,000	₹ 11,400	• Finished Stock*	25,000	₹ *43,400*
• Units introduced	20,000	7,200	• Closing Stock	5,000	6,400
Material		16,000			
Labour		15,200			
Overhead					
	30,000	49,800		30,000	49,800

*Cost of units transferred to finished stock account has been arrived at as follows:

	₹
• Value of opening stock	11,400
• Cost of work done for completing opening stock (refer to statement for appointment of cost)	8,000
• Cost of units introduced and completed (refer to statement for appointment of cost)	<u>24,000</u>
	<u>43,400</u>

*** When material is introduced at 30% stage of processing***

Process Z **Period:**
(Adoption FIFO method)

INPUT		OUTPUT		EQUIVALENT COMPLETED UNITS					
Details	Units	Details	Units	Material		Labor		Overhead	
				Units	Stage of completion %	Units	Stage of completion %	Units	Stage of completion %
• Op. Stock	10,000	• Completed:							
• Units Introduced	20,000	• Work on Op. Stock	10,000	-	-	5000	50	5000	50
		Units-introduced and completed							
		• CL. Stock	15,000	15000	100	15000	100	15000	100
			5000	5,000	100	4000	80	4000	80
	30,000		30,000	20,000		24,000		24000	

Statement of Cost for each Element

Element of Cost	Cost	Equivalent units	Completed	Cost/Unit
	₹	Units		₹
Material	7,200	20,000		0.30
Labour	16,000	24,000		0.67
Overhead	15,200	24,000		0.63
	38,400			

Statement of Apportionment of Cost

Items	Elements	Equivalent completed units	Cost/Unit	Cost	Total	
Op. Stock	Material	-	₹ -	₹ -	₹ -	
	Labour	5000	0.67	3,350	6,500	
	Overhead	5000	0.63	3,150		
Units (introduced and completed)	Material	15000	0.36	5400		24,900
	Labour	15000	0.67			
	Overhead	15000	0.63		10,050	
Closing-stock	Material	5400	0.36	9,450	7,000	
	Labour	4000	0.67	1,800		
	Overhead	4000	0.63	2,680		
				2,520		
					38,400	

Process Z – Account

Details	Units	Amt	Details	Units	Amt.
• Opening Stock	10,000	₹ 11,400	• Finished Stock*	25,000	₹ *42,800*
• Units introduced	20,000		• Closing Stock	5,000	7,000
Material		7,200			
Labour		16,000			
Overhead		15,200			
	30,000	49,800		30,000	49,800

*Cost of units transferred to finished stock account has been arrived at as follows:

	₹
• Value of opening stock	11,400
• Cost of work done for completing opening stock	6,500
(refer to statement for appointment of cost)	
• Cost of units introduced and completed	<u>24,900</u>
(refer to statement for appointment of cost)	<u>42,800</u>

*** When material is introduced at the end of process***

Process Z

Period:

(Adoption FIFO method)

Statement of Equivalent completed units

INPUT		OUTPUT		EQUIVALENT COMPLETED UNITS					
Details	Units	Details	Units	Material		Labor		Overhead	
				Units	Stage of completion %	Units	Stage of completion %	Units	Stage of completion %
Op. Stock	10,000	<ul style="list-style-type: none"> Completed: Work on Op. Stock Units-introduced and completed CL. Stock 	10,000	10,000	100	5000	50	5000	50
Units Introduced	20,000			15,000	100	15000	100	15000	100
				5000	-	4000	80	4000	80
	30,000			30,000	25,000			24,000	

Statement of Cost for each Element

Element of Cost	Cost	Equivalent units	Completed	Cost/Unit
	₹	Units		₹
Material	7,200	20,000		0.30
Labour	16,00	24,000		0.67
Overhead	0	24,000		0.63
	15,20			
	0			
	38,40			
	0			

Statement of Apportionment of Cost

Items	Elements	Equivalent completed units	Cost/Unit	Cost	Total	
			₹	₹	₹	
Op. Stock	Material	10,000	0.288	2880	9,380	
	Labour	5000	0.670	3350		
	Overhead	5000	0.630	3150		
Units (introduced and completed)	Material	15000	0.288	4,320	23,820	
	Labour	15000	0.670			
	Overhead	15000	0.630			
Closing-stock	Material	-	-	9,450		5,200
	Labour	4000	0.670	-		
	Overhead	4000	0.630	2,680		
				2,520		
					38,400	

Process Z – Account

Details	Units	Amt	Details	Units	Amt.
• Opening Stock	10,000	₹ 11,400	• Finished Stock	25,000	₹ *44,600*
• Units introduced	20,000			5,000	5200
Material		7,200	• Closing Stock		
Labour		16,000			
Overhead		15,200			
	30,000	49,800		30,000	49,800

*Cost of units transferred to finished stock account has been arrived at as follows:

	₹
• Value of opening stock	11,400
• Cost of work done for completing opening stock (refer to statement for appointment of cost)	9,380
• Cost of units introduced and completed (refer to statement for appointment of cost)	23,820
	<u>44,600</u>

Transfer Pricing Profit in Inventory Valuation

When transfer price from one process to another includes profit, the cost of closing stock should be reduced by unearned profit. The practice of including profit in transfer price is resorted to for the following reasons:

- Profit of different processes is determined separately and each process is considered profit centre.
- The process in which units are introduced, do not get the benefits of economies affected in the proceeding process.
- This practice induces competition in different processes. Competition ultimately leads to economy.

When relationship of cost and transfer price is given, relationship of cost and profit should be determined. There should be no difficulty in finding out profit, when relationship of cost and profit is given. Profit of 20% on transfer price is the same as profit of 25% on cost. Unearned profit included in closing stock and its exhibition in the balance sheet should be determined by applying the steps:

- Process is divided into three (3) columns i.e. total, cost and profit. Total column equal to cost column plus profit column. Total column serves as cost for determining transfer price relating to process.

Steps under process I

- Cost relating to opening stock should be written in first and second columns as no profit element in opening stock of process one.
- Cost of material, and direct labour relating to process one should be included in both total column and cost column.
- Closing stock, which is valued at cost, its value is reduced in first and second columns in closing stock of process one.
- Overhead relating to process one and two are added in first and second columns.

- The balance arrived at in first column, i.e. total column determines the profit relating to process one, by applying the relationship of cost and profit, if relationship of profit and transfer price is given, relationship between cost and profit is determined.

- Profit is added in the first and last columns first column is the transfer price of process one. It is the sum total of cost and profit columns.

Steps under Process Two (II)

- Details relating to opening stock of process two (ii) are written in first, second and third columns.

- Cost of material, labour and overhead relating to the process are added in first and second columns.

- For closing stock in the process, the profit element included in it is determined by applying the relationship between “total column” and “profit column” after step dot (b). Total value of closing stock has to be reduced by profit arrived at cost relating to the closing stock. The total value, cost and profit relating to the closing stock are written in the first, second and third columns.

- The balance in first column (total column), arrived at determines the profit relating to process two (ii) by applying relationship of cost and profit. Where relationship of cost and transfer price is known, the relationship between cost and price is virtually determined.

The profit determined by applying the cost and profit relationship is referred to as apparent profit. From apparent profit (notional profit), actual profit is determined.

Notional Profit (+) unearned profit in opening stock (-) unearned profit in closing stock equals to Actual profit.

NP (+) UEP of Op. St. (-) UEP of Cl. St. = AP

Details relating to Cl. St. are shown in three columns i.e. total, cost and profit.

Closing stock exhibited in Balance sheet at cost shown in column of cost i.e. column two (2).

DATA K: Information regarding process K of Farmex Meyer Nig. Plc. The company produces a pharmaceutical product that passes through three processes, before it is transferred to a finished stock. The information available for the month of Dec. 2011:

	Process I	Process II	Process III	Finished Stock
	N	N	N	N
• Opening Stock	40,000	48,000	32,000	120,000
• Direct Material	80,000	84,000	120,000	-
• Direct Labour	60,000	60,000	64,000	-
• Production Overhead	56,000	24,000	160,000	-
• Closing Stock	20,000	24,000	16,000	60,000
• Profit on cost of each process	33 ½	25%	25%	-
• Inter-process profit for opening stock	-	8,000	8,000	44,000

Stock in process are valued at prime cost and finished stock at price at which it was received from process (3) three. The sales during the period was N14,00,000. Show:

- Process account showing profit element at each stage.
- Statement showing actual profit realized.

Stock valuation for balance sheet purposes.

• **Process account showing profit at each stage**

Farmex Nig. Plc

Process I account

period: Dec. 2011

	Total	Cost	Profit		Total	Cost	Profit
	₦	₦	₦		₦	₦	₦
Opening stock	40,000	40,000	-	Process II a/c (transfer)	288,000	216,000	72,000
Direct material	80,000	80,000	-				
Direct labour.	60,000	60,000	-				
	180,000	180,000	-				
Less closing stock	0	0	-				
PRIME COST	20,000	20,000	-				
(+) Mgf. Overhead	160,000	160,000	-				
TC of Production	0	0	-				
(+) 33⅓ of TCP (GP)	56,000	56,000	-				
	216,000	216,000	-				
Closing Stock b/d	0	0	72,000				
	72,000	-	0				
	288,000	216,000	72,000		288,000	216,000	72,000
	0	0	0		0	0	0
	20,000	20,000	-				

* There is no profit in closing stock of process I

Farmex Nig. Plc

Process II account period: Dec. 2011

	Total	Cost	Profit		Total	Cost	Profit
	₦	₦	₦		₦	₦	₦
Opening stock	48,000	40,000	8,000	Process III a/c (transfer)	600,000	404,000	196,000
Process I transfer.	288,000	216,000	72,000				
Direct material	84,000	84,000	-				
Direct labour.	60,000	60,000	-				
Less closing stock	480,000	400,000	80,000				
PRIME COST	24,000	20,000	4,000				
(+) Mgf. Overhead TC of Production	456,000	380,000	76,000				
(+) Gross profit (25% of TCP)	24,000	24,000	-				
Closing Stock b/d	480,000	404,000	76,000				
	120,000	-	120,000				
	600,000	404,000	196,000	600,000	404,000	196,000	

* Profit relating to process I is determined as follows:

- TC collected x 33⅓% = ₦216,000 x 33⅓% = ₦ 72,000

- Profit element in closing stock is determined as:

$$\text{Profit/total} \times \text{closing stock i.e. } \frac{\text{₦ } 80,000}{\text{₦ } 480,000} \times \text{₦ } 24,000 = \text{₦ } 4000$$

Relationship for determining profit element in Cl. St. should be noted:

Profit relating to process II is determined as:

- TC collected for transfer to process III x 25%.

$$\text{i.e. } \text{₦ } 480,000 \times 25\% = \text{₦ } 120,000.$$

Farmex Nig. Plc

Process III account

period: Dec. 2011

	Total	Cost	Profit		Total	Cost	Profit
	₦	₦	₦		₦	₦	₦
Opening stock	32,000	24,000	8,000	Finished goods transferred	1200,00 0	760,00 0	440,00 0
Process II A/c	600,000	404,000	196,000				
Direct material	120,000	120,000	0				
Direct labour.	64,000	64,000	-				
			-				
Less closing stock	816,000	612,000	204,000				
PRIME COST	16,000	12,000	0				
(+) Mgf. Overhead			4,000				
TC of Production	800,000	600,000	200,000				
(+) Gross Profit (25% of TCP)	160,000	160,000	0				
			-				
Closing Stock b/d	960,000	760,000	200,000				
	240,000	-	0				
			240,000				
			0				
	1200,000	760,000	440,000				
			0				
	16,000	12,000	4,000		1200,000	760,000	440,000
					0	0	0

* Profit element in closing stock of process III is determined as:

• Profit/total x closing stock = ₦ 204,000/₦ 816,000 x ₦ 16,000 = ₦4,000

* Profit relating to process III is determined as follows:

TC collected for transfer to finished stock x 25%

i.e. $\frac{₦ 960,000 \times 25}{100} = ₦ 240,000$

100

Farmex Nig. Plc

Finished Stock Account

period: Dec. 2011

	Total	Cost	Profit		Total	Cost	Profit
	₦	₦	₦		₦	₦	₦
Opening stock	120,000	76,000	44,000	Sales	1400,000	798,000	602,000
Process III A/C (transfer).	1200,000	760,000	440,000				
	1320,000	836,000	484,000				
Less closing stock	60,000	38,000	22,000				
	1260,000	798,000	462,000				
Profit	140,000	-	140,000				
	1400,000	798,000	602,000				
Closing Stock b/d							
	60,000	38,000	22,000				
					0	0	*

* Profit relating to closing stock is determined as follows:

$$\frac{\text{Profit}}{\text{Total}} \times \text{closing stock}$$

i.e. $\frac{\text{₹ 484,000}}{\text{₹ 1320,000}} \times \text{₹ 60,000} = \text{₹ 22,000}$

Statement Showing Notional (Apparent Profit) and Actual Profit

	Apparent Profit from (+) Process	Unrealized Profit in (-) Opening Stock	Unrealized profit in Closing Stock	=	Actual profit
	₹	₹	₹		₹
Process I	72,000	-	-		72,000
Process II	120,000	8,000	4,000		124,000
Process III	240,000	8,000	4,000		244,000
Finished St.	<u>140,000</u>	<u>44,000</u>	<u>22,000</u>		<u>162,000</u>
	<u>572,000</u>	<u>60,000</u>	<u>30,000</u>		<u>*602,000*</u>

Valuation of Stock for Balance Sheet Purpose

- Closing stock of process I at cost N 20,000
- Closing stock of process II at cost 20,000 (refer to details of Cl. St. in process II fig. taken from 2nd column)
- Closing stock of process III at cost 12,000 (refer to details of Cl. St. in process III. Fig. taken from 2nd column)
- Closing stock of finished goods A/C in finished stock. Fig. taken from 2nd column) 38,000 (refer to details of Cl. St.)
- Closing St. to be exhibited in B/S = *90,000*

TEST OF VALIDITY

The result can be cross checked as follows:

Total cost included in all the processes

- **Process I** N
 - Material 80,000
 - Labour 60,000
 - Overhead 56,000
 - **Process II** 84,000
 - Material 84,000
 - Labour 60,000
 - Overhead 24,000
 - **Process III** 120,000
 - Material 120,000
 - Labour 64,000
 - Overhead 160,000
 - Add cost of Op. St. (40,000 + 40,000 + 24,000 + 76,000) 180,000
- 708,000
888,000

- Less cost of goods sold 798,000 (refer to finished
St. A/C 2nd column
- Cl. St. to be exhibited in Balance Sheet *90,000*

Conclusions

The study of impact of adaptability of different inventory valuation techniques in determination of organizational profitability is a “decision rule” to managerial decision criteria. This is because inventory valuation has a great implication to organizational performance and the adoptability of each technique must be considered taking into consideration its validity in cost ascertainment and precision in judging the representative figures in the Balance sheet date and the underlying assumptions acceptable on each technique/application. For this reason, an organization must consider factors which will influence positively a method of inventory valuation, as this is an asset at the Balance Sheet date.

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