



Control of Indirect Cost in Construction

KEYWORDS

Activity Based Costing, Direct Cost, Traditional Based Costing, Indirect Cost, Overhead

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ABSTRACT

The direct cost which mainly include material and labour, are chargeable to the end products without difficulty and are thus convenient to handle. The indirect costs also know as overhead which create problems for the cost accountant in determining the accurate product cost Activity based costing is an upcoming and more refined approach for charging indirect costs to products and computing more accurate product costs.

I. INTRODUCTION

Traditional cost accounting has been criticized for cost distortion and the lack of Relevance. A traditional system reports where and by whom money is spent on, but fails to report the cost of activities and processes. Many organizations, including petroleum and semiconductor companies in the manufacturing industry, have adopted the new costing method, activity based costing (ABC).

There are two purposes of activity-based costing. The first is to prevent cost distortion. Cost distortion occurs because traditional costing combines all indirect costs into a single cost pool. This pool is allocated on the basis of some resource common to all of the company's products, typically direct labor. Cost distortion is prevented in ABC by adopting multiple cost pools (activities) and cost drivers. The second purpose is to minimize waste or non-value-adding activities by providing a process view. This objective can be achieved by activity analysis and (or) the function of monitoring activities.

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1. Methodology

1.1 General

The methodology and how to apply it in the real time project, and what are the Steps carried out to bring the result and comparisons are discussed.

1.2 Traditional Cost Management.

Traditional cost management focuses on products. It is a process that real project product cost is calculated on the foundation of confirmation and calculation quantity of resources consumed.

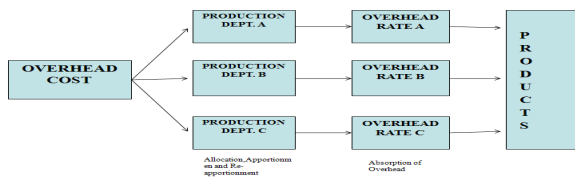


Fig. 1.1 Traditional Overhead Costing

1.3 Activity Based Cost Management.

Activity based cost management focuses on activity based cost calculation, on the foundation of the dynamic informa-

tion provided by activity based cost calculation analyses and amends all activity based cost and leads cost management deep into activity based. It eliminates the no-value added activities so as to promote operation efficiency of value added activities more competitive. Finally the level of production and management of the entire value chain will be improved continuously.

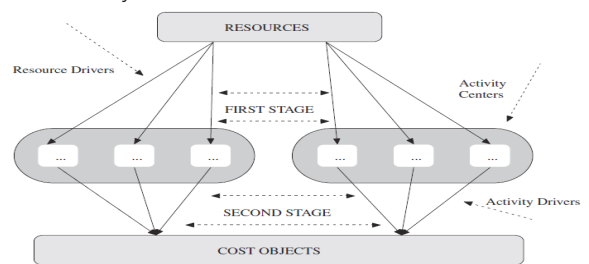


Fig. 1.2 ABC Process flowchart

The following are the steps in activity based cost allocation:

- ❖ Identification of the main activities
- ❖ Creation of cost pool
- ❖ Determination of the activity cost drivers
- ❖ Calculation of the activity cost driver rate
- ❖ Charging the costs of activities to product

Distribution of overhead cost to the activity by the method of ABC is shown in the following Figure

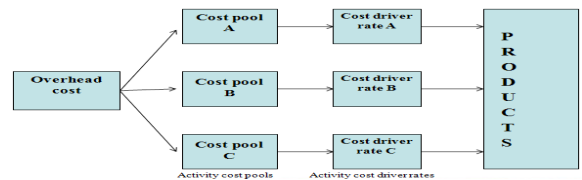
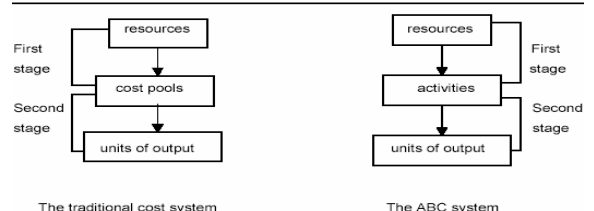


Fig. 1.3 ABC Overhead Costing

1.4 ABC Versus Traditional Costing Systems.



Source: Cooper et al. (1992a: pp.9-10)

Figure 1.4 ABC Vs Traditional costing

The previous diagram compares the traditional cost systems to the ABC system. Both methods have differences not only in the nature of allocation bases, but also in the number of allocation bases utilized to assign costs in the second stage. The traditional cost system employs three common allocation bases, such as direct labor hours, machine hours and material Costs, whereas ABC utilizes many allocation bases, such as set-up hours, number of times ordered, number of times and lead and other transaction-related bases.

1.5 The Benefits of ABC

ABC is claimed to furnish many significant benefits over traditional costing techniques: enhanced product cost accuracy; more comprehensive cost information for performance measurement; more pertinent data for management's decision-making; more potential for sensitivity analysis; and providing a model prospect on value-adding organizational transactions and activities.

2. Introduction Marriage Hall

2.1 General

Marriage hall is an ongoing project. The site location is at Punnainallur, opposite to Mariamman temple, Thanjavur District, Tamilnadu, India. The Project has been started during the 2nd Week of June 2013. The project is going to be carried out and studied using the Activity Based Costing methodology.

2.2 Profile of the Project

Name of Work : Construction of Marriage Hall @ Punnainallur Village in Thanjavur District.

Owner's Name : Mr. Durai Verrannan.
Engineering Consultant : M/S Surya Builders, Thanjavur.
Structural Consultant : M/S Primetech Inc., Thanjavur.

2.3 marriage hall details

- ❖ Marriage hall is Ground Plus One Storied building with plinth area of 680 Sq.m. provided with adequate number of stair cases, Standby power, etc.,
- ❖ Ground Floor consist of Reception Hall, Dining Hall, Kitchen and Vessels Store. Ground Floor of area 654.75 Sq.m.
- ❖ First Floor consists of Marriage hall, bride room, bride groom room, toilet & Bathroom, Stage for Marriage function and Stage for Taval & Nadasvaram. First Floor of Area 660.93 Sq.m.

3. Site Investigation Details

3.1 General

After visiting the site for duration of two weeks, various details were collected from the site regarding the project, here are the few important details given below which is used in the project.

3.2 Foundation Concrete

Work Starts during the 1st week of July. Total number of manpower employed and materials consumed in the foundation concrete are

- ❖ Mason : 30 Nos.
- ❖ Men Mazdoor : 170 Nos.
- ❖ Women Mazdoor : 250 Nos.
- ❖ Fitter : 100 Nos.
- ❖ Cement : 600 Bags. (6 Trips X 100Bags/Trip).
- ❖ 20 mm Blue metal : 8 Loads. (300 cft./load).
- ❖ River Sand : 5 Loads. (250 cft/Load).
- ❖ Steel : 3 Ton. (2 Trips X 1.5 Ton/Trip).
- ❖ Mixer machine 2 Nos. : 6 Days.
- ❖ Vibrator : 6 Days

3.3 Grade Beam Concrete

Work Starts during the 1st week of August. Total number of

manpower employed and materials consumed in the grade beam concrete are,

- 1) Mason : 15 Nos.
- 2) Men Mazdoor : 90 Nos.
- 3) Women Mazdoor : 150 Nos.
- 4) Fitter : 180 Nos.
- 5) Carpenter : 130 Nos.
- 6) Helper : 180 Nos.
- 7) Cement : 400 Bags. (4 Trips X 100Bags/Trip)
- 8) 20 mm Blue metal : 4 Loads. (300 cft./load).
- 9) River Sand : 3 Loads. (250 cft/Load).
- 10) Steel : 5 Ton. (4 Trips X 1.5 Ton/Trip).
- 11) Mixer machine 2 Nos. : 3 Days.
- 12) Vibrator : 3 Days

3.4 Column Concrete

Work Starts during 1st week of September. Total number of manpower employed and materials consumed in the column concrete are,

- ❖ Mason : 15 Nos.
- ❖ Men Mazdoor : 75 Nos.
- ❖ Women Mazdoor : 120 Nos.
- ❖ Fitter : 200 Nos.
- ❖ Carpenter : 120 Nos.
- ❖ Helper : 180 Nos.
- ❖ Cement : 300 Bags. (3 Trips X 100Bags/Trip).
- ❖ 20 mm Blue metal : 4 Loads. (300 cft./load).
- ❖ River Sand : 2 Loads. (250 cft/Load).
- ❖ Steel : 5 Ton. (4 Trips X 1.5 Ton/Trip).
- ❖ Mixer machine : 5 Days.
- ❖ Vibrator : 5 Days

3.5 Brick Work upto Ground Floor level

Work Starts during the 1st week of October. Total number of manpower employed and materials consumed in the brick work are,

- ❖ Mason : 60 Nos.
- ❖ Men Mazdoor : 50 Nos.
- ❖ Women Mazdoor : 100 Nos.
- ❖ Cement : 100 Bags. (1Trips X 100Bags/Trip).
- ❖ Bricks : 40,000 Nos.
- ❖ River Sand : 2 Loads. (250 cft/Load).

3.6 Roof Concrete

Work Starts during the 1st week of December. Total number of manpower employed and materials consumed in the column concrete are,

- ❖ Mason : 4 Nos.
- ❖ Men Mazdoor : 5 Nos.
- ❖ Fitter : 300 Nos.
- ❖ Carpenter : 300 Nos.
- ❖ Helper : 300 Nos.
- ❖ Ready Mix Concrete : 90 Cum.
- ❖ Vibrator : 1 Day.
- ❖ Steel : 9.5 Ton. (6 Trips X 1.5 Ton/Trip).

4. Resource Based Costing

4.1 General

In this method that resources are directly assigned to a cost account (a subproject) in direct costs. Each resource becomes an individual cost account in overhead costs. We use the term 'Resource-Based Costing' as opposed to Activity-Based Costing. RBC assigns costs directly to sub-projects, cost accounts or work packages defined in the work breakdown structures, as if the costs that arise in the execution of work packages also have their causes in those work packages. This traditional one-stage costing, in which resources are traced directly to products and services, is undertaken from the perspective of a "transformation view", which conceives production as a transformation of inputs into outputs.

4.2 Current Costing Method

The following Table 4.1 shows the information that the current method can provide. Costs are categorized into each resource type.

Resource based costing

Job	Description	Costs(Rs.)
1	Reinforcement for Foundation	2,05,000/-
2	Reinforcement for Column	3,62,000/-
3	Concrete for foundation	4,48,250/-
4	Form work for Grade Beam	1,87,000/-
5	Reinforcement for Grade Beam	3,32,000/-
6	Concrete for Grade Beam	3,40,500/-
7	Form work for Column	1,66,000/-
8	Concrete for Column	2,19,400/-
9	Brick Work up to GF slab Level.	2,75,500/-
10	Reinforcement for GF slab	6,34,000/-
11	Form work for GF slab	4,12,000/-
12	Concrete for GF slab	4,50,000/-
	Sub Total	40,31,650/-
1	Supervisor(6 Months)	36,000/-
2	Project Engineer(6 Months)	54,000/-
3	Project Manager(6 Months)	1,50,000/-
4	Warehouse Guard(6 Months)	30,000/-

	Sub Total	2,70,000/-
	Total	43,01,650/-

Some observations on the current method:

- ❖ Overhead costs are not usually assigned to each activity. Therefore, it is hard to get accurate costs for each activity. As a result, managers do not have accurate information on where profits and losses arise, or where opportunities and needs for waste reduction exist with a cost report.
- ❖ As shown in Table 4.1, the current method does not provide a process view because costs for each resource are categorized in terms of resources rather than activities/process steps.

5. Comparison of Activities using ABC

5.1 General

This chapter deals with calculation and comparison of activities in ABC method and the results which are obtained from the calculation is plotted in graph to show the result of ABC.

5.2 Activity-Based Costing

The first step in Activity based costing is to define cost objects. Suppose that there are twelve cost objects: reinforcement for foundation, concrete for foundation, form work for grade beam, reinforcement for grade beam, concrete for column, concrete for column, brick work up to GF slab, form work for GF slab, reinforcement for GF slab, concrete for GF slab. Suppose that the results of activity analysis are as shown in Table 5.1. For example, an activity "reinforcement for foundation" costs Rs.1000 and the number of receipt was 2. The unit rate for the activity is Rs.500 because the number of receipt is selected as a cost driver (Rs.1,000 / 2 = Rs.500).

Table 5.1

.Process Costing	Cost Driver	Hierarchy	Found. (Reinf.)	Found. (Conc.)	Column (Reinf.)	Column (Form)	Column (Conc.)	Grade beam (Form)	Grade beam (Reinf.)	Grade beam (Conc.)	Brick Work	GF slab (Form)	GF slab (Reinf.)	GF slab.	Total	Unit Rate (Rs.)
Re-ceive Form	No. of Re-ceipt	Pro-cure-ment Batch	-	-	-	1	-	2	-	-	-	4	-	-	7	500
Re-ceive Steel	No. of Re-ceipt	Pro-cure-ment Batch	2	-	4	-	-	-	4	-	-	-	6	-	16	500
Re-ceive Ce-ment	No. of Re-ceipt	Pro-cure-ment Batch	-	6	-	-	3	-	-	4	1	-	-	-	14	500
Car-penter	Direct labour	Unit	-	-	-	952	-	980	-	-	-	2068	-	-	4000	75
Help-er	Direct labour	Unit	-	-	-	1352	-	1390	-	-	-	2938	-	-	5680	50
Steel Fitter	Direct labour	Unit	732	-	1493	-	-	-	1360	-	-	-	2660	-	6245	62.50
Con-cret-ing Mason	Direct labour	Unit	-	200	-	-	90	-	-	112	-	-	-	252	654	62.50
Men Maz.	Direct labour	Unit	-	1200	-	-	546	-	-	680	283	-	-	1527	4236	50
Wom-en Maz.	Direct labour	Unit	-	2000	-	-	910	-	-	1130	566	-	-	2542	7058	33.75
Brick Work Ma-son	Direct labour	Unit	-	-	-	-	-	-	-	-	424	-	-	-	424	75

General Supervision	Proportional to Direct Labour Hour	Project	2.59%	12%	5.28%	8.14%	5.46%	8.38%	4.8%	6.79%	4.5%	17.39%	9.4%	15.27%	100%
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The overhead rates developed in Table 5.1 can now be used to assign process costs to cost objects as shown in Table 5.3

Table 5.2

	Found. (Reinf.)	Found. (Conc.)	Column (Reinf.)	Column (Form)	Grade beam (Form)	Grade beam (Reinf.)	Grade beam (Conc.)	Column (Conc.)	Brick Work	GF (Form)	GF (Reinf.)	GF (Conc.)	Total
Direct Material	144000	301000	240000	20000	35000	240000	187000	148000	192000	100000	456000	312140	2375140
Receive Form				500	1000					2000			3500
Receive Steel	1000		2000			2000					3000		8000
Receive Cement		3000					2000	1500	500				7000
Carpenter				71400	73500					155100			300000
Helper				67600	69500					146900			284000
Steel Fitter	45750		93313			85000					166250		390313
Concreting Mason		12500					7000	5625				15750	40875
Men Maz.		60000					34000	27300	14150			76350	211800
Women Maz.		67500					38138	30713	19103			85793	241247
Brick Work Mason									31800				31800
General Supervision	6993	32400	14256	21978	14742	22626	12960	18333	12150	46953	25380	41229	270000

Observations:

- (1) As shown in Table 5.3, costs for each of the five activities are different using ABC (activity-based costing) versus using RBC (resource-based costing).
- (2) Activities and their costs are shown in ABC cost reports (Table 5.2) whereas only resource types and their costs are shown in RBC cost reports (Table 4.1). ABC provides managers with a process view as to where the costs accumulate and at what rate.

Table 5.3

ABC					RBC		
	Direct Material	Direct Labour	Overhead	Total	Direct Material	Process Costs	Total
Foundation	4,45,000	1,85,750	43,393	6,74,143	4,45,000	2,47,643	6,92,643
Column (upto GF Slab)	4,08,000	2,95,951	58,567	7,62,518	4,08,000	3,93,967	8,01,967
Grade Beam	4,62,000	3,07,138	55,328	8,24,466	4,62,000	4,47,828	9,09,828
Brick Work up to GF Slab	1,92,000	65,053	12650	2,69,703	1,92,000	95,650	2,87,650
GF Slab	8,68,140	6,46,143	1,18,562	16,32,845	4,56,000	11,53,562	16,09,562
Total	23,75,140	15,00,035	2,88,500	41,63,675	19,63,000	23,38,650	43,01,650

5.4 Comparison of Cost using ABC & RBC

WORKS DONE	ABC in Rs	COMPANY
Foundation	674143	692642
Grade Beam	762518	801967
Column up to GF Slab	824466	909828
Brick Work up to GF Slab	269703	287650
Ground floor	1632845	1609562

II. CONCLUSION

This project shows an example of the application of ABC in Marriage hall construction and its potential benefits compared with Traditional costing. This is achieved by finding the overhead cost of the activities and a detailed comparison between ABC & RBC. Project can encompass the cost control by adopting an activity-based costing system.

Table 5.5 Comparison of Total Cost using ABC & RBC (Up to GF Slab Level)

TOTAL ESTIMATED VALUE FROM ABC METHOD	TOTAL ESTIMATED VALUE OF THE OWNER
Rs.41,63,675	Rs.43,01,650

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