

# INDIRECT PRODUCTION COSTS TWO ALLOCATION METHODS

## Traditional IPC Cost Allocation

*aggregates all categories of indirect costs, and allocates them to products/services in some logical but ultimately arbitrary manner*

## Activity-Based Costing

*identifies the particular indirect activities that drive (cause) the indirect costs, and allocates them to products/services based on the amount of activity demanded by each product or service*

# **TRADITIONAL COST ALLOCATION**

- **Method of allocation is selected**
- **Costs allocated before actual expenditures are known**
- **Difference between allocation and expenditures treated as a variance**

# TRADITIONAL COST ALLOCATION

## Procedure - Part I

### 1. Determine IPC vehicle

*common traditional IPC vehicles include direct-labor hours, direct-labor dollars, material dollars, machine hours, units of production*

### 2. Determine IPC rate

*estimate total production activity and calculate IPC rate = budgeted IPC expenditures / budgeted IPC vehicle quantity*

### 3. Calculate IPC absorbed

*IPC absorbed = IPC rate \* specific IPC vehicle quantity*

**REMINDER: IPC = Indirect Production Cost**  
**= Overhead**  
**= Burden**

# TRADITIONAL COST ALLOCATION

## Procedure - Part II

### 4. Determine variance

*variance = difference between actual expenditures and total IPC absorbed*

### 5. Reconcile variance

*Actual IPC expenditure is Debited to the IPC Variance account; Absorbed IPC is Credited to the IPC Variance account*

### 6. Interpret variance

*If variable (direct) costing is used, the IPC Variance is a "true" spending variance; If full-absorption costing is used, the IPC Variance is driven by both volume and spending*

**page 395, #16.2: Mehban and Sons produces industrial blending equipment, primarily Model 431 and Model 631, which have the following characteristics:**

	<u>Model 431</u>	<u>Model 631</u>
Direct material per unit	\$261	\$388
Direct labor hours per unit	14.5	16.1

Mehban's standard labor wage rate is \$11.50 per hour.  
Mehban's production plan for 1995 calls for

Total direct material cost	\$12,820,000
Total direct labor hours	836,000
Total IPC expenditures	16,377,000

- a) Assume that the IPC (indirect production cost) vehicle is direct material cost. What are the total product costs for each of the models? By what percentage does the cost of Model 631 exceed the cost of Model 431?
  
- b) Assume that the IPC vehicle is direct labor hours. What are the total product costs for each of the models? By what percentage does the cost of Model 631 exceed the cost of Model 431?

page 395, #16.2:

a) IPC rate = Budgeted IPC expenditures  
 ÷ Budgeted direct material cost  
 = \$16,377,000 ÷ \$12,820,000  
 = \$1.28 per direct material \$

<u>Per Unit Cost</u>	<u>Model 431</u>	<u>Model 631</u>
Direct material	\$261.00	\$ 388.00
Direct labor (\$11.50/hr)	166.75	185.15
IPC (\$1.28/Direct material \$)	<u>334.08</u>	<u>496.64</u>
Total	\$761.83	\$1069.79

\$1069.79/761.83 = 1.404 ⇒ Model 631 is about 40% more costly than Model 431

b) IPC rate = Budgeted IPC expenditures  
 ÷ Budgeted direct labor hours  
 = \$16,377,000 ÷ 836,000  
 = \$19.59 per direct labor hour

<u>Per Unit Cost</u>	<u>Model 431</u>	<u>Model 631</u>
Direct material	\$261.00	\$388.00
Direct labor (\$11.50/hr)	166.75	185.15
IPC (\$19.59/Direct labor hr)	<u>284.06</u>	<u>315.40</u>
Total	\$711.81	\$888.55

\$888.55/711.81 = 1.248 ⇒ Model 631 is about 25% more costly than Model 431

**page 397, #16.6 (a and b):**

In May, Kimball Corporation's total production can be summarized as follows:

Total direct material consumed	\$5,981,000
Total direct labor wages earned	\$1,692,000
Total expenditures on IPC elements	\$5,312,000
Total number of units produced	558,000

- a) If Kimball's IPC rate is \$3.10 per direct-labor dollar, what was Kimball's IPC variance for May? (Note whether the variance has a debit or credit balance.)
- b) If, alternatively, Kimball's IPC rate is \$10 per unit produced, what was Kimball's variance for May? (Note whether the variance has a debit or credit balance.)

page 397, #16.6 :

a) IPC rate of \$3.10 per direct-labor dollar:

*Budgeted-rate IPC expenditures were:*

*(\$3.10 per direct-labor dollar)*

*x (\$1,692,000 direct-labor dollars)*

*= \$5,245,200*

*In the IPC Variance account:*

*Dr: Actual total IPC expenditures                      \$5,312,000*

*Cr: Budgeted-rate IPC expenditures                      \$5,245,200*

*The DEBIT balance is (5,312,000 - 5,245,200) = \$66,800*

b) IPC rate of \$10 per unit produced:

*Budgeted-rate IPC expenditures were:*

*(\$10 per unit produced) x (558,000 units)*

*= \$5,580,000*

*In the IPC Variance account:*

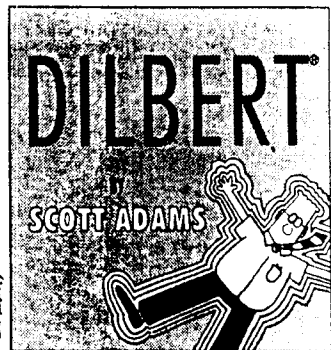
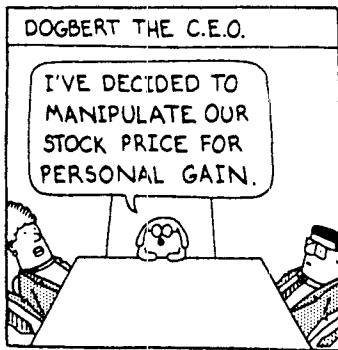
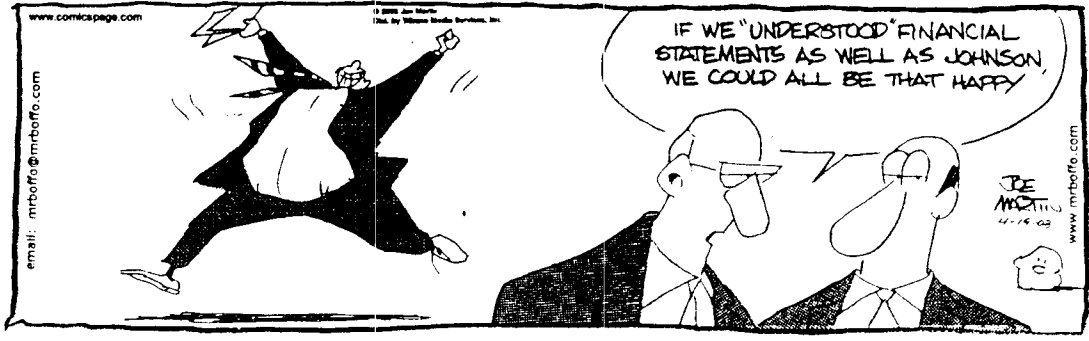
*Dr: Actual total IPC expenditures                      \$5,312,000*

*Cr: Budgeted-rate IPC expenditures                      \$5,580,000*

*The CREDIT balance is (5,580,000 - 5,312,000) = \$268,000*



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## **ACTIVITY-BASED COSTING**

*Products/services should absorb Indirect Production Costs to the extent that they cause or exacerbate such costs*

*Activity-Based Costing results are satisfactory for cost-related decisions regarding pricing, engineering design, and operations*

# **ACTIVITY BASED COSTING**

## **SEEKS COST DRIVERS**

*those activities,  
or process or product characteristics,  
that cause, or drive,  
indirect production costs*

## **ABC PROCESS**

- *Identify cost driver activities*
- *Collect costs associated with each cost driver activity*
- *Allocate costs to each product or service based on its use of the cost driver activity*

## WHEN ABC IS NEEDED

- **Least likely to be needed when a narrow range of similar products/services are provided**
- **Most likely to be needed when a diverse range of low-volume and high-volume products/services are provided**
- **Indicators may include:**
  - *functional managers want to drop seemingly profitable lines*
  - *hard-to-make products show big profits*
  - *departments have their own cost systems*
  - *competitors' prices are unrealistically low*

## COMPARISON from EXAMPLE

from Figure 16-3, page 375:

	Products		
	M8	T4	T6
Direct labor	\$133	\$ 209	\$ 135
Direct material	124	278	843
IPC*	<u>445</u>	<u>700</u>	<u>452</u>
	\$702	\$1,187	\$1,430

\*IPC per-unit = 335% of direct labor per unit.

from Figure 16-7, page 378:

	M8	T4	T6
Units produced	5,420	6,160	2,220
IPC per unit*	\$ 376	\$ 592	\$1,151
Direct labor†	133	209	135
Direct material†	<u>124</u>	<u>278</u>	<u>843</u>
	\$ 633	\$1,079	\$2,129

\*Annual IPC for product divided by annual units produced.

†From Figure 16-3.

## **Types and Examples of Cost Drivers (from Barnes):**

### **Volume-Related:**

- Direct Labor Hours**
- Machine Hours**
- Direct Material Costs**
- Floor Space**

### **Transaction-Related:**

- Set-ups**
- Receiving Orders**
- Material Handling**
- Inspections**
- Scheduling Orders**

### **Product-Related:**

- Physical Features (size, weight, surface area, finish)**
- Complexity (parts per product, precision)**
- Engineering Change Orders**

### **Selling, Administrative, General:**

- Catalog Pages and Changes**
- Utilization of Channel of Distribution**
- Capital Investment**

From page 459, Riggs

FIGURE T.6 Tritex Corporation: Information Relevant to Activity-Based Costing

Activities	Budget 1994 (\$000)
Assembly supervision	\$1,285
Assembly set-up	582
Purchasing	847 ←
Receiving and stores	1,511
Production control & scheduling	738
Software troubleshooting	691
Manufacturing engineering	1,263
Quality assurance—assembly	416
Quality assurance—checkout and calibration	911
	<u>\$8,244</u>

*Cost Driver Standard Direct material \$*

*Would be possibly go into overhead*

Product Characteristics	System Products		
	Apollo	Zeus	Custom
Annual volume (units)	5,400	3,850	2,300
Price per unit	\$875	\$2,426	\$4,625
Standard D.L. hours per unit	9.7 hours	15.2 hours	29.6 hours
Average lot size	1,000	600	20
Number of part numbers	137	416	475
Computer memory capacity	0	X	6X
Average time in check out	4 hours	11 hours	23 hour
Standard direct material \$ per unit	\$124	\$ 700	\$1,363

## **TRITEX**

- ✓ **Overhead rate currently determined based on estimated direct labor wages**
  
- ✓ **Completely redetermine Overhead based on  
Activity components and Cost Drivers**
  
- ✓ **Determine a new Product Cost per Unit based on  
Direct Labor \$ per Unit (see Figure T.2)  
Direct Material \$ per Unit (see Figure T.2)  
Redetermined Overhead \$ per Unit**
  
- ✓ **Compare  
ABC Product Cost per Unit  
Standard Product Cost per Unit (see Figure T.2)**



## TRITEX

### Allocating the Purchasing Activity in the Overhead

**Selected Cost Driver is Direct Material Cost**

**STANDARD Direct Material Cost per Unit (Figure T.6)**

Apollo	Zeus	Custom
\$124	\$700	\$1,363

**Annual Volume in Units (Figure T.6)**

5,400	3,850	2,300
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**Product of the preceding two variables:**

\$669,600	\$2,695,000	\$3,134,900	\$6,499,500
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**Determine percentages:**

10.3%	41.5%	48.2%	100.0%
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**Allocate the Purchasing Budget (\$847,000 from Figure T.6)  
in accord with Percentages:**

\$87,421	\$35,505	\$408,254	\$847,000
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**This allocates ONE component of Overhead based on  
Activity and Cost Driver**