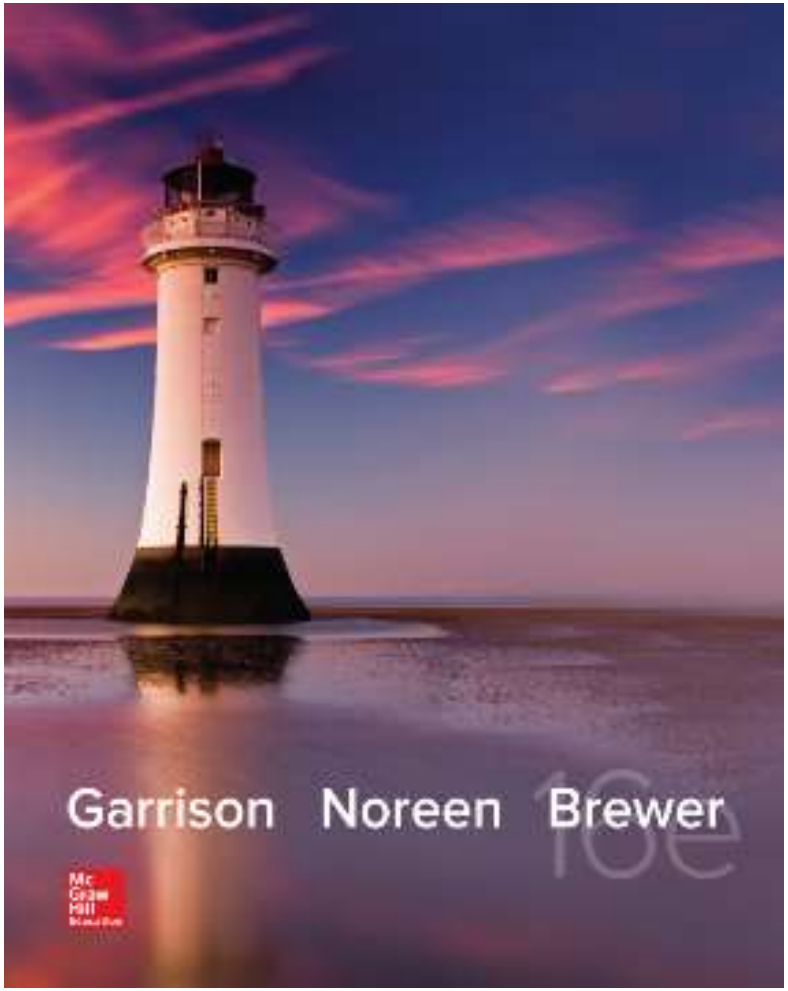
Managerial Accounting

Sixteenth Edition



Chapter 2

Job-Order Costing: Calculating Unit Product Costs

Job-Order Costing: An Overview (1 of 2)

Job-order costing systems are used when:

1. Many different products are produced each period.
2. Products are manufactured to order.
3. The unique nature of each order requires tracing or allocating costs to each job, and maintaining cost records for each job.

Job-Order Costing: An Overview (2 of 2)

Examples of companies that would use job-order costing include:

1. Boeing (aircraft manufacturing)
2. Bechtel International (large scale construction)
3. Walt Disney Studios (movie production)

Job-Order Costing – Cost Flow 1

- Direct Costs
  - Direct Materials
    - Job No. 1
    - Job No. 2
    - Job No. 3
  - Direct Labor
    - Job No. 1
    - Job No. 2
    - Job No. 3

Charge direct material and direct labor costs to each job as work is performed.

Job-Order Costing – Cost Flow 2

- Direct Costs
  - Direct Materials
  - Direct Labor
- Indirect Costs
  - Manufacturing Overhead
    - Job No. 1
    - Job No. 2
    - Job No. 3

Manufacturing Overhead, including *indirect materials* and *indirect labor,* are allocated to all jobs rather than directly traced to each job.

The Job Cost Sheet

PearCo Job Cost Sheet

Job Number A - 143 Date Initiated 3-4-17

Date Completed

Department B3 Units Completed

Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount

Cost Summary	Units Shipped		
Direct Materials	Date	Number	Balance
Direct Labor			
Manufacturing Overhead			
Total Cost			
Unit Product Cost			

Measuring Direct Materials Cost – Part 1

PearCo Materials Requisition Form

Requisition No. X7 - 6890 Date 3-4-17
Job No. A - 143
Department B3

Description	Quantity	Unit Cost	Total Cost
2 x 4, 12 feet	12	$ 3.00	$ 36.00
1 x 6, 12 feet	20	4.00	80.00
			$ 116.00

Authorized Signature *Will E. Delite*

Measuring Direct Materials Cost – Part 2

PearCo Job Cost Sheet

Job Number A - 143 Date Initiated 3-4-17

Date Completed

Department B3 Units Completed

Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116						

Cost Summary		Units Shipped		
Direct Materials	$ 116	Date	Number	Balance
Direct Labor				
Manufacturing Overhead				
Total Cost				
Unit Product Cost				

Measuring Direct Labor Costs

PearCo Employee Time Ticket

Time Ticket No. 36 Date 3-5-17

Employee I. M. Skilled Station 42

Starting Time	Ending Time	Hours Completed	Hourly Rate	Amount	Job No.
0800	1600	8.00	$ 15.00	$ 120.00	A-143
Totals		8.00	$ 15.00	$ 120.00	A-143

Supervisor C. M. Workman

Job-Order Cost Accounting

PearCo Job Cost Sheet

Job Number A - 143
Date Initiated 3-4-17
Date Completed
Department B3
Units Completed
Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116	36	8	$ 120			

Cost Summary		Units Shipped		
Direct Materials	$ 116	Date	Number	Balance
Direct Labor	$ 120			
Manufacturing Overhead				
Total Cost				
Unit Product Cost				

Learning Objective 1

Compute a predetermined overhead rate.

Why Use an Allocation Base?

An allocation base, such as direct labor hours, direct labor dollars, or machine hours, is used to assign manufacturing overhead to individual jobs.

We use an allocation base because:

a. It is impossible or difficult to trace overhead costs to particular jobs.
b. Manufacturing overhead consists of many different items ranging from the grease used in machines to the production manager's salary.
c. Many types of manufacturing overhead costs are fixed even though output fluctuates during the period.

Manufacturing Overhead Application

The predetermined overhead rate (*POHR*) used to apply overhead to jobs is determined before the period begins.

$$\text{POHR} = \frac{\text{Estimated total manufacturing overhead cost for the coming period}}{\text{Estimated total units in the allocation base for the coming period}}$$

Ideally, the allocation base is a **cost driver** that causes overhead.

The Need for a POHR

Predetermined overhead rates that rely upon estimated data are often used because:

1. Actual overhead for the period is not known until the end of the period, thus inhibiting the ability to estimate job costs during the period.
2. Actual overhead costs can fluctuate seasonally, thus misleading decision makers.

Computing Predetermined Overhead Rates (1 of 2)

The predetermined overhead rate is computed before the period begins using a four-step process.

1. Estimate the total amount of the allocation base (the denominator) that will be required for next period's estimated level of production.
2. Estimate the total fixed manufacturing overhead cost for the coming period and the variable manufacturing overhead cost per unit of the allocation base.

Computing Predetermined Overhead Rates (2 of 2)

3. Use the following equation to estimate the total amount of manufacturing overhead:

$$Y = a + bX$$

Where,

Y = The estimated total manufacturing overhead cost

a = The estimated total fixed manufacturing overhead cost

b = The estimated variable manufacturing overhead cost per unit of the allocation base

X = The estimated total amount of the allocation base

4. Compute the predetermined overhead rate.

Learning Objective 2

Apply overhead cost to jobs using a predetermined overhead rate.

Overhead Application Rate (1 of 2)

PearCo estimates that it will require 160,000 direct labor-hours to meet the coming period's estimated production level. In addition, the company estimates total fixed manufacturing overhead at $200,000, and variable manufacturing overhead costs of $2.75 per direct labor hour.

$Y = a + bX$

Y = $200,000 + ($2.75 per direct labor-hour × 160,000 direct labor-hours)

Y = $200,000 + $440,000

Y = $640,000

Overhead Application Rate (2 of 2)

$$\text{POHR} = \frac{\$640{,}000 \text{ estimated total manufacturing overhead}}{160{,}000 \text{ estimated direct labor hours (DLH)}}$$

POHR = $4.00 per direct labor-hour

Recording Manufacturing Overhead

PearCo Job Cost Sheet

Job Number A - 143
Department B3
Item Wooden cargo crate

Date Initiated 3-4-17
Date Completed 3-5-17
Units Completed 2

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116	36	8	$ 120	8	$ 4	$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	$ 116			
Direct Labor	$ 120			
Manufacturing Overhead	$ 32			
Total Cost				
Unit Product Cost				

Learning Objective 3

Compute the total cost and the unit product cost of a job using a plantwide predetermined overhead rate.

Calculating Total Cost of Job

PearCo Job Cost Sheet

Job Number A - 143 Date Initiated 3-4-17

Date Completed 3-5-17

Department B3 Units Completed 2

Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116	36	8	$ 120	8	$ 4	$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	$ 116			
Direct Labor	$ 120			
Manufacturing Overhead	$ 32			
Total Cost	$ 268			
Unit Product Cost				

Calculating Unit Product Cost

PearCo Job Cost Sheet

Job Number A - 143
Date Initiated 3-4-17
Date Completed 3-5-17
Department B3
Units Completed 2
Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116	36	8	$ 120	8	$ 4	$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	$ 116			
Direct Labor	$ 120			
Manufacturing Overhead	$ 32			
Total Cost	$ 268			
Unit Product Cost	$ 134			

Quick Check 1

Job WR53 at NW Fab, Inc. required $200 of direct materials and 10 direct labor hours at $15 per hour. Estimated total overhead for the year was $760,000 and estimated direct labor hours were 20,000. What would be recorded as the cost of job WR53?

a. $ 200.

b. $ 350.

c. $ 380.

d. $ 730.

Quick Check 1a (1 of 2)

Job WR53 at NW Fab, Inc. required $200 of direct materials and 10 direct labor hours at $15 per hour. Estimated total overhead for the year was $760,000 and estimated direct labor hours were 20,000. What would be recorded as the cost of job WR53?

a. $200.

b. $350.

c. $380.

d. $730.

Answer: d

Quick Check 1a (2 of 2)

POHR	= $ 760,000/20,000 hours	$ 38
Direct materials		$ 200
Direct labor	$ 15 × 10 hours	$ 150
Manufacturing overhead	$ 38 × 10 hours	$ 380
Total cost		$ 730

Job-Order Costing – A Managerial Perspective – Part 1

Inaccurately assigning manufacturing costs to jobs adversely influences planning and decisions made by managers.

1. Job-order costing systems can accurately trace ***direct*** materials and ***direct*** labor costs to jobs.
2. Job-order costing systems often fail to accurately allocate the manufacturing overhead costs used during the production process to their respective jobs.

Job-Order Costing – A Managerial Perspective – Part 2 (1 of 2)

Choosing an Allocation Base

Job-order costing systems often use allocation bases that do not reflect how jobs actually use overhead resources. The allocation base in the predetermined overhead rate must **drive** the overhead cost to improve job cost accuracy. A **cost driver** is a factor that causes overhead costs.

Job-Order Costing – A Managerial Perspective – Part 2 (2 of 2)

Many companies use a single predetermined **plantwide overhead rate** to allocate all manufacturing overhead costs to jobs based on their usage of direct-labor hours.

1. It is often **overly-simplistic** and incorrect to assume that direct-labor hours is a company's *only* manufacturing overhead cost driver.
2. If more than one overhead cost driver can be identified, job cost accuracy is improved by using **multiple predetermined overhead rates**.

Learning Objective 4

Compute the total cost and the unit product cost of a job using multiple predetermined overhead rates.

Information to Calculate Multiple Predetermined Overhead Rates (1 of 2)

Dickson Company has two production departments, Milling and Assembly. The company uses a job-order costing system and computes a predetermined overhead rate in each production department. The predetermined overhead rate in the Milling Department is based on machine-hours and in the Assembly Department it is based on direct labor-hours. The company uses cost-plus pricing (and a markup percentage of 75% of total manufacturing cost) to establish selling prices for all of its jobs. At the beginning of the year, the company made the following estimates:

Information to Calculate Multiple Predetermined Overhead Rates (2 of 2)

	Department : Milling	Department : Assembly
Machine-hours.....	60,000	3,000
Direct labor-hours.....	8,000	80,000
Total fixed manufacturing overhead cost.....	$ 390,000	$ 500,000
Variable manufacturing overhead per machine-hour.....	$ 2.00	--
Variable manufacturing overhead per direct labor-hour....	--	$ 3.75

Step 1 – Calculate the Predetermined Overhead Cost for Each Department

During the current month the company started and completed Job 407. It wants to use its predetermined departmental overhead cost and rate for the Milling and Assembly Departments.

- Milling Department = $ 390,000 + ($ 2.00 per MH × 60,000 MHs) = $ 510,000
- Assembly Department = $ 500,000 + ($ 3.75 per DLH × 80,000 DLHs) = $ 800,000

Step 2 – Calculate the Predetermined Overhead Rate for Each Department

Use the amounts determined on the previous slide to calculate the predetermined overhead rate (POHR) of each department.

- Milling Department = $ 510,000 ÷ 60,000 MHs = $ 8.50 per MH
- Assembly Department = $ 800,000 ÷ 80,000 DLHs = $ 10.00 per DLH

Step 3 – Calculate the Amount of Overhead Applied from Both Departments to a Job

Use the POR calculated on the previous slide to determine the overhead applied from both departments to Job 407:

Job 407	Department: Milling	Department: Assembly
Machine-hours……	90	4
Direct labor-hours……	5	20
Direct materials…….	$ 800	$ 370
Direct labor cost……	$ 70	$ 280

Milling Department = 90 MHs × $ 8.50 per MH = $ 765

Assembly Department = 20 DLHs × $ 10 per DLH = $ 200

Step 4 – Calculate the Total Job Cost for Job 407

We can use the information given to calculate the amount of the total cost of Job 407. Here is the calculation:

	Milling	***Assembly***	***Total***
Direct materials.....	$ 800	$ 370	$ 1,170
Direct labor.....	$ 70	$ 280	350
Manufacturing overhead applied.....	$ 765	$ 200	965
Total cost of Job 407.....			$ 2,485

Step 5 – Calculate the Selling Price for Job 407 (1 of 2)

The selling price of Job 407 assuming a 75% markup.

Total cost of Job 407…….	$ 2,485.00
Markup ($2,485 × 75%)……	1,863.75
Selling price of Job 407…….	$ 4,348.75

Step 5 – Calculate the Selling Price for Job 407 (2 of 2)

It is important to emphasize that using a departmental approach to overhead application results in a different selling price for Job 407 than would have been derived using a Plantwide overhead rate based on either direct labor-hours or machine-hours. The appeal of using predetermined departmental overhead rates is that they presumably provide a more accurate accounting of the costs caused by jobs, which in turn, should enhance management planning and decision making.

Multiple Predetermined Overhead Rates—An Activity-Based Approach

- When a company creates overhead rates based on the activities that it performs, it is employing an approach called ***activity-based costing***.
- **Activity-based costing** is an alternative approach to developing multiple predetermined overhead rates. Managers use activity-based costing systems to more accurately measure the demands that jobs, products, customers, and other cost objects make on overhead resources.

Job-Order Costing for Financial Statements to External Parties

The amount of overhead applied to all jobs during a period will differ from the actual amount of overhead costs incurred during the period.

1. When a company applies less overhead to production than it actually incurs, it creates what is known as **underapplied** overhead.
2. When it applies more overhead to production than it actually incurs, it results in **overapplied** overhead.

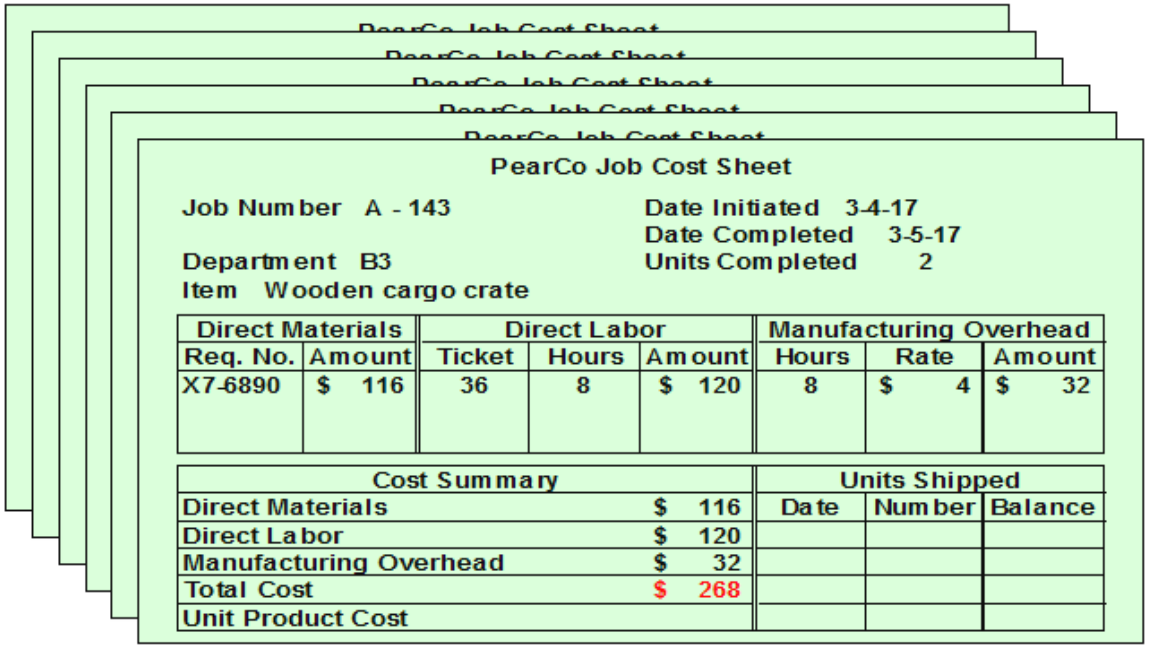
Financial Adjust for Overhead Applied

The cost of goods sold reported on a company's income statement must be adjusted to reflect underapplied or overapplied overhead.

1. The adjustment for **underapplied** overhead **increases cost of goods** sold and decreases net operating income.
2. The adjustment for **overapplied** overhead **decreases cost of goods sold** and increases net operating income.

Job Cost Sheets: A Subsidiary Ledger

All of a company's job cost sheets collectively form a **subsidiary ledger.**



PearCo Job Cost Sheet

Job Number A - 143
Date Initiated 3-4-17
Date Completed 3-5-17
Department B3
Units Completed 2
Item Wooden cargo crate

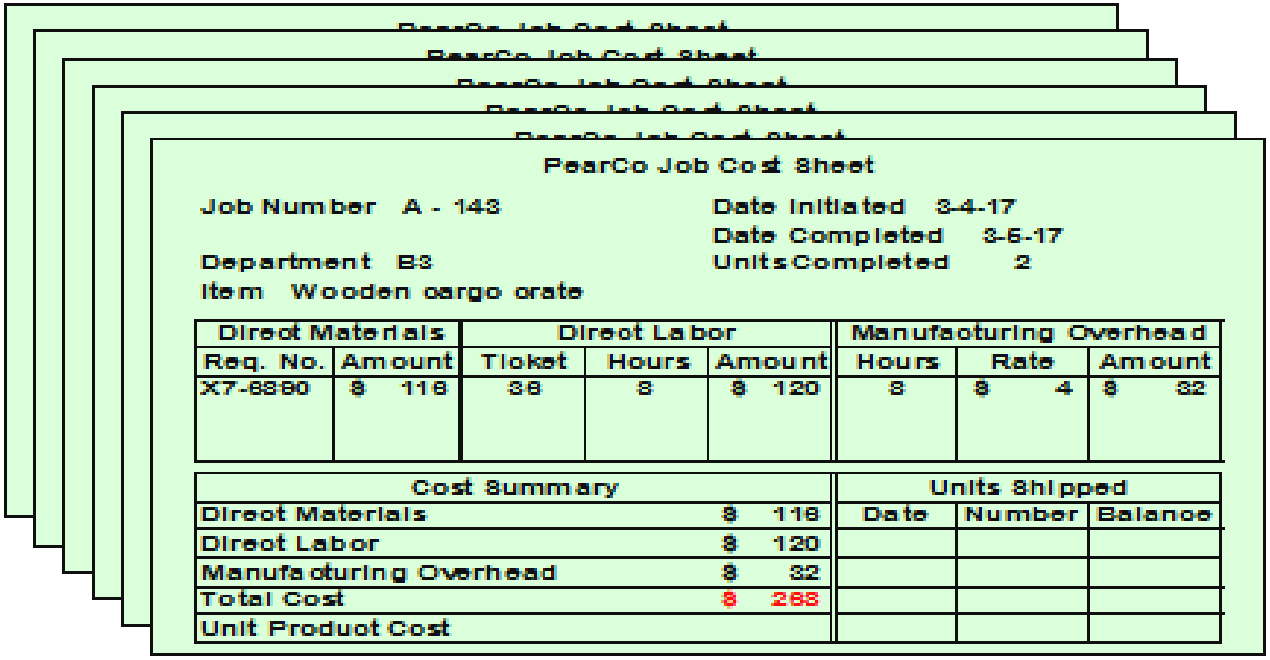
Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116	36	8	$ 120	8	$ 4	$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	$ 116			
Direct Labor	$ 120			
Manufacturing Overhead	$ 32			
Total Cost	$ 268			
Unit Product Cost				

Job Cost Sheets: Balance Sheet Reporting (1 of 2)

The job costs sheets provide an underlying set of financial records that explain what specific jobs comprise the amounts reported in **Work-in-Process** and **Finished Goods** on the balance sheet.

Job Cost Sheets: Balance Sheet Reporting (2 of 2)



PearCo Job Cost Sheet

Job Number A - 143
Date Initiated 3-4-17
Date Completed 3-6-17
Department B3
Units Completed 2
Item Wooden cargo crate

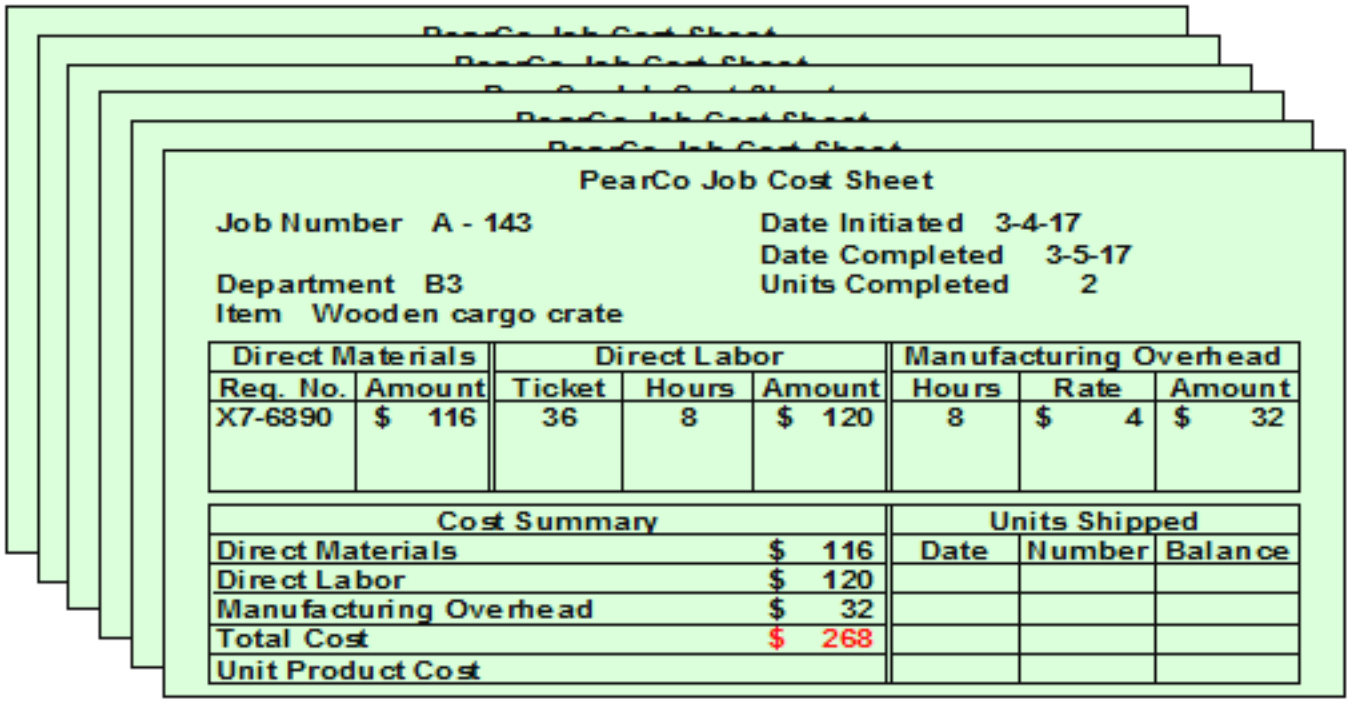
Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-8880	$ 118	38	8	$ 120	8	$ 4	$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	$ 118			
Direct Labor	$ 120			
Manufacturing Overhead	$ 32			
Total Cost	$ 288			
Unit Product Cost				

Job Cost Sheets: Income Statement Reporting (1 of 2)

The job costs sheets provide an underlying set of financial records that explain what specific jobs comprise the amounts reported in **Cost of Goods Sold** on the income statement.

Job Cost Sheets: Income Statement Reporting (2 of 2)



PearCo Job Cost Sheet

Job Number A - 143
Date Initiated 3-4-17
Date Completed 3-5-17
Department B3
Units Completed 2
Item Wooden cargo crate

Direct Materials		Direct Labor			Manufacturing Overhead		
Req. No.	Amount	Ticket	Hours	Amount	Hours	Rate	Amount
X7-6890	$ 116	36	8	$ 120	8	$ 4	$ 32

Cost Summary		Units Shipped		
		Date	Number	Balance
Direct Materials	$ 116			
Direct Labor	$ 120			
Manufacturing Overhead	$ 32			
Total Cost	$ 268			
Unit Product Cost				

Job-Order Costing in Service Companies

Although our attention has focused upon manufacturing applications, it bears re-emphasizing that job-order costing is also used in service industries. Job-order costing is used in many different types of service companies. For example, law firms, accounting firms, and medical treatment.

End of Presentation