

# The Production Cycle

## Sistem Informasi Akuntansi

*Accounting Information Systems, 9/e, Romney/Steinbart*  
Prentice Hall Business Publishing,

### **Production Cycle Activities**

- There are four basic activities in the production cycle:
  - 1. Product design**
  - 2. Planning and scheduling**
  - 3. Production operations**
  - 4. Cost accounting**

## Product Design (Activity 1)

- The first step in the production cycle is product design.
- The objective of this activity is to design a product that meets customer requirements for quality, durability, and functionality while simultaneously minimizing production costs.

## Product Design (Activity 1)

- *Documents and procedures:*
- The product design activity creates two main documents:
  - 1 Bill of materials
  - 2 Operations list

## **Product Design (Activity 1)**

- How can accountants be involved in product design?
  - by showing how various design trade-offs affect production costs and thereby profitability
  - by ensuring that the AIS is designed to collect and provide information about the machine setup and materials handling costs associated with alternative product designs
  - by providing data about repair and warranty costs associated with existing products

## **Planning and Scheduling (Activity 2)**

- The second step in the production cycle is planning and scheduling.
- The objective of this step is a production plan efficient enough to meet existing orders and anticipate short-term demand without creating excess finished goods inventories.

## Planning and Scheduling (Activity 2)

- What are two common methods of production planning?
  - 1 Manufacturing resource planning (MRP-II)
  - 2 Just-in-time (JIT) manufacturing systems
    - MRP-II is an extension of materials resource planning that seeks to match existing production capacity and raw materials needs with forecasted sales demands.
    - The goal of JIT is to minimize inventories of raw materials, work in process, and finished goods.

## Planning and Scheduling (Activity 2)

- *Documents, forms and procedures:*
  - The *master production schedule (MPS)* specifies how much of each product is to be produced during the planning period and when that production should occur.
  - A *materials requisition* authorizes removal of materials from the storeroom to the factory.
  - Subsequent transfers of these materials are documented on *move tickets*.

## Planning and Scheduling (Activity 2)

- How can accountants be involved in planning and scheduling?
  - by ensuring that the AIS collects and reports costs in a manner consistent with the production planning techniques used by the company
  - by helping to choose whether MRP-II or JIT is more appropriate

## Production Operations (Activity 3)

- The third step in the production cycle is the actual manufacture of products.
- The manner in which this activity is accomplished varies greatly across companies.
- What is computer-integrated manufacturing (CIM)?
  - It is the use of information technology in the production process.

## Production Operations (Activity 3)

- Computer-Integrated Manufacturing (CIM) is the use of various forms of IT in the production process, such as robots and computer-controlled machinery, to reduce production costs.
- Every firm needs to collect data about the following four facets of its production operations:
  1. Raw materials used
  2. Labor-hours expended
  3. Machine operations performed
  4. Other manufacturing overhead costs incurred

## Cost Accounting (Activity 4)

- The final step in the production cycle is cost accounting.
- What are the three principal objectives of the cost accounting system?
  1. To provide information for planning, controlling, and evaluating the performance of production operations
  2. To provide accurate cost data about products for use in pricing and product mix decisions
  3. To collect and process the information used to calculate the inventory and cost of goods sold values

## Cost Accounting (Activity 4)

- What are two types of cost accounting systems?
  - 1 Job-order costing
  - 2 Process costing
- Job-order costing assigns costs to specific production batches or to individual jobs.
- Process costing assigns costs to each process, and then calculates the average cost for all units produced.

## Cost Accounting (Activity 4)

- The choice of job-order or process costing affects only the method used to assign costs to products, not the method used for data collection.
- *Raw Materials:*
  - When production is initiated, the issuance of a materials requisition triggers the journal entry.

## Cost Accounting (Activity 4)

- Assume that \$15,000 of raw materials were issued.
- What is the journal entry?

Work in Process	15,000	
Raw Materials Inventory	15,000	To record issuance of raw materials

- Assume that \$1,000 of raw materials were returned to inventory.

## Cost Accounting (Activity 4)

- What is the journal entry?

Raw Materials Inventory	1,000	
Work in Process		1,000

*To record return of raw materials to inventory*

- Most raw materials are bar-coded.
- Inventory clerks use online terminals to enter usage data for those items that are not bar-coded.

## Cost Accounting (Activity 4)

- *Direct Labor:*
- A job-time ticket is a paper document used to collect data about labor activity.
- This document records the amount of time a worker spent on each specific job task.
- Workers can enter this data using online terminals at each factory workstation.

## Cost Accounting (Activity 4)

- *Machinery and Equipment:*  
As companies implement CIM to automate the production process, an even larger proportion of product cost relate to the machinery and equipment used to make the product.

## Cost Accounting (Activity 4)

- *Manufacturing Overhead:*
- What is manufacturing overhead?
  - all manufacturing costs that are not economically feasible to trace directly to specific jobs or processes

## Cost Accounting (Activity 4)

- *Accounting for Fixed Assets:*
- The AIS also needs to collect and process information about investment in the property, plant, and equipment used in the production cycle.
- Fixed assets should be bar-coded.

## Cost Accounting (Activity 4)

- identification number
- serial number
- location
- cost
- date of acquisition
- vendor name and address
- expected life

What minimum information should organizations keep about their fixed assets?

- expected salvage value
- depreciation method
- depreciation charges to date
- improvements
- maintenance services performed

## Control: Objectives, Threats, and Procedures

- The *second function* of a well-designed AIS is to provide adequate controls to ensure that the following objectives are met:
  1. All production and fixed asset acquisitions are properly authorized.
  2. Work-in-process inventories and fixed assets are safeguarded.
  3. All valid, authorized production cycle transactions are recorded.
  4. All production cycle transactions are recorded accurately.
  5. Accurate records are maintained and protected from loss.
  6. Production cycle activities are performed efficiently and effectively.

## Control: Objectives, Threats, and Procedures

- What are some *threats*?
  - unauthorized transaction
  - theft or destruction of inventories and fixed assets
  - recording and posting errors
  - loss of data
  - inefficiencies and quality control problems

## Control: Objectives, Threats, and Procedures

- What are some *control procedures*?
  - accurate sales forecasts and inventory records
  - authorization of production
  - restricted access to production planning program and to blank production order documents
  - review and approval of capital asset expenditures

## Control: Objectives, Threats, and Procedures

- documentation of all internal movements of inventory
- proper segregation of duties
- source data automation
- online data entry edit controls
- backup and disaster recovery procedures
- regular performance reports
- cost of quality control measurement

## Information Needs and Procedures

- The *third function* of the AIS is to provide information useful for decision making.
- In the production cycle, cost information is needed by internal and external users.
- Traditionally, most cost accounting systems have been designed primarily to meet financial reporting requirements.

## Information Needs and Procedures

- What are two major criticisms of traditional cost accounting systems?
  1. Inappropriate allocation of overhead costs
  2. Inaccurate performance measures

## Information Needs and Procedures

What is a potential solution to the first criticism?

- *Activity-Based Costing (ABC)*:
  - ABC attempts to trace costs to the activities that create them and only subsequently allocates those costs to products or departments.

## Information Needs and Procedures

- ABC systems distinguish three separate categories of overhead.
  1. Batch-related overhead
  2. Product-related overhead
  3. Company-wide overhead
- The bases used to allocate manufacturing overhead are the cost drivers.
- What is a cost driver?
  - anything that has a cause-and-effect relationship on costs

## Information Needs and Procedures

- What are some benefits of ABC?
  - better decisions
  - improved cost management
- More accurate cost data results in better product mix and pricing decisions.
- More detailed cost data improves management's ability to control and manage total costs.

## Information Needs and Procedures

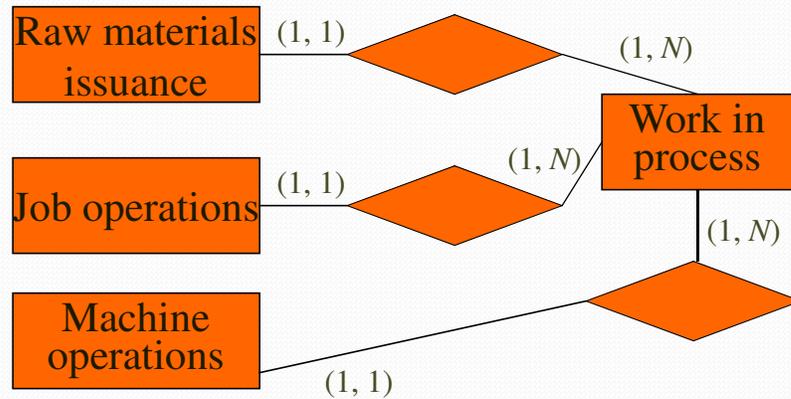
- What is the potential solution to the second criticism?
  - Integrated production cycle data model

## Production Cycle Data Model

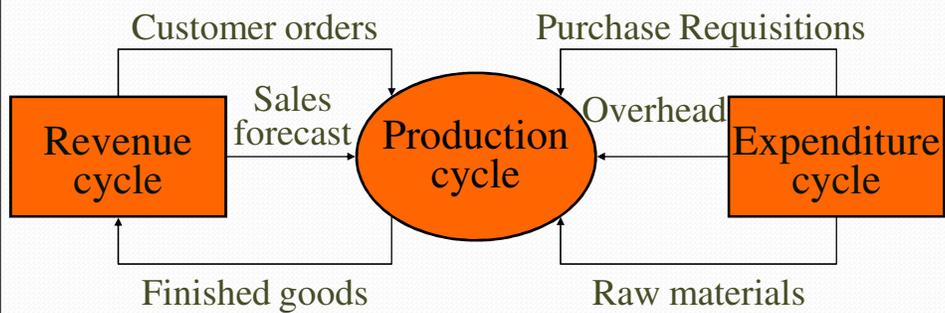
- To maximize its usefulness for cost management and decision making, production cycle data must be collected at the lowest possible level of aggregation.
- The following diagram presents relationships between the work in process (*resource entity*) and raw materials, labor, and machine operations (*event entities*) used to produce a batch of goods.

## Production Cycle Data Model

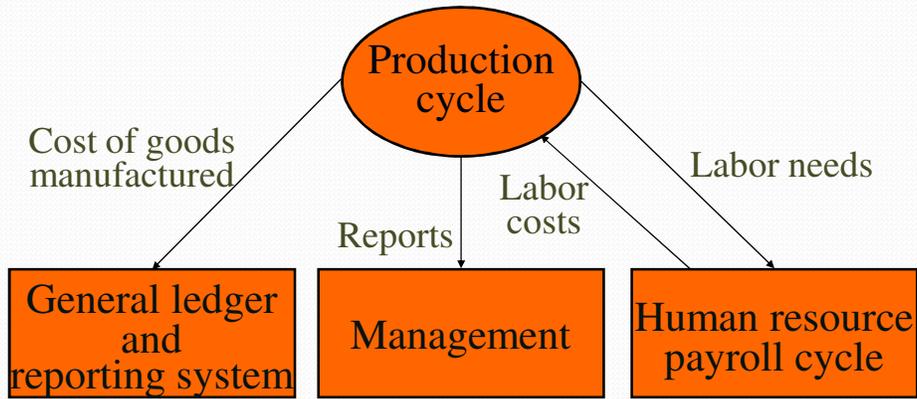
Partial REA Diagram of the Production Cycle



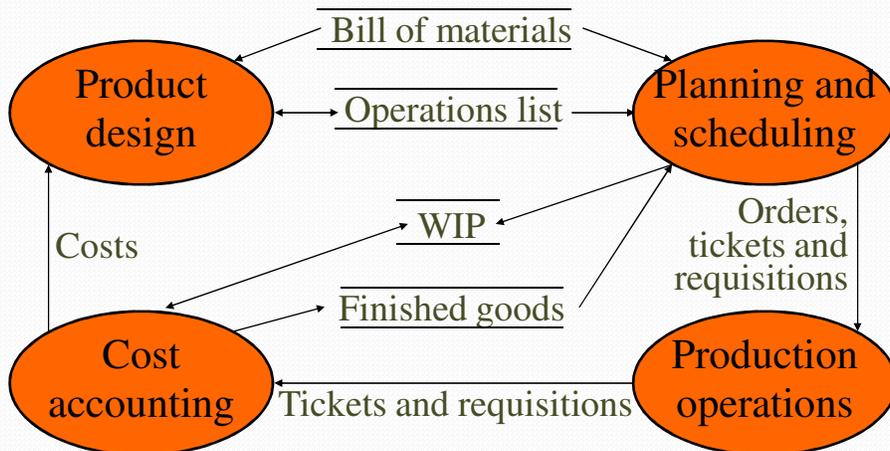
## Production Cycle



## Production Cycle



## Production Cycle



## Production Cycle Data Model

- What are the relationships among work in process and the three *event* entities?
  - all are one-to-many
- What do they reflect?
  - Each production run may involve a number of raw materials issuances, labor operations, and machine operations.
  - Each of those activities, however, is linked to a specific production run.

## Production Cycle Data Model

Partial REA Diagram of the Production Cycle

