HR Cycle & Production Cycle
Topik Bahasan

- Human Resource Cycle
- Production Cycle
Sumber Materi

- Romney / Steinbart, Accounting Information Systems, 9th Edition ch.11-12, Prentice Hall
Learning Objectives

1. Describe the major business activities and related data processing operations performed in the human resources management (HRM)/payroll cycle.

2. Identify the major threats in the HRM/payroll cycle, and evaluate the adequacy of various internal control procedures for dealing with them.
Learning Objectives

3. Explain the key decisions that need to be made in the HRM/payroll cycle, and identify the information required to make those decisions.

4. Read and understand a data model (REA diagram) of the HRM/payroll cycle.

5. Create a data model (REA diagram) of the HRM/payroll cycle.
Introduction

- The HRM/payroll cycle is a recurring set of business activities and related data processing operations associated with effectively managing the employee workforce.
- Some of the more important activities include the following tasks:
  - recruitment and hiring
  - training
Introduction

- job assignment
- compensation (payroll)
- performance evaluation
- discharge of employees, due to voluntary or involuntary termination

• This chapter focuses primarily on the payroll system.
Learning Objective 1

Describe the major business activities and related data processing operations performed in the human resources management (HRM)/payroll cycle.
Figure 14-1  Context diagram of the payroll portion of the HRM/payroll cycle

HRM department → Payroll changes → Reports → Payroll system → Paychecks → Employees

Various departments → Time and attendance data → Reports → Payroll system → Paychecks → Employees

Government agencies → Payroll taxes and tax reports → Payroll system → Paychecks → Employees

Paychecks → Withholdings and deductions → Bank

Payroll check → Rate changes and instructions → Checks and reports → Insurance and other companies

Tax rates and instructions
Payroll Cycle Activities

- The *first function* of the AIS is processing transactional data.
- Why is payroll processed in batch mode?
  - Paychecks are prepared periodically.
  - Most employees are paid at the same time.
Payroll Cycle Activities

- What are the basic activities performed in the payroll cycle?
  1. Update master payroll file
  2. Update tax rates and deductions
  3. Validate time and attendance data
  4. Prepare payroll
  5. Disburse payroll
  6. Calculate employer-paid benefits and taxes
  7. Deduct payroll taxes and other deductions
Figure 14-2  Level 0 DFD for the payroll cycle

1.0 Update payroll master file
   ↓
2.0 Update tax rates and deductions
   ↓
3.0 Validate time and attendance data
   ↓
4.0 Prepare payroll
   ↓
5.0 Disburse payroll
   ↓
6.0 Calculate employer-paid benefits and taxes
   ↓
7.0 Disburse payroll taxes and miscellaneous deductions

- Job-time tickets
- Various departments
- Time cards
- Reports
- Payroll master
- General ledger
- Tax rates and deductions
- Payroll changes
- HRM department
- Reports
- Insurance and other companies
- Checks and reports
- Payroll deductions and taxes
- Payroll taxes and tax reports
- Government agencies
- Employees
- Bank
Figure 14-3 HRM/payroll flowchart
Update Master Payroll File (Activity 1)

- The first activity in the HRM/payroll cycle involves updating the payroll master file to reflect payroll changes such as new hires, terminations, changes in pay rates, or changes in discretionary withholdings.

- It is important that all payroll changes are entered in a timely manner and are properly reflected in the next pay period.
Update Tax Rates and Deductions (Activity 2)

- The second activity in the HRM/payroll cycle involves updating information about tax rates and other withholdings.
- These changes happen whenever updates about changes in tax rates and other payroll deductions are received from various government units and insurance companies.
Validate Time and Attendance Data (Activity 3)

- The third activity in the payroll cycle is to validate each employee’s time and attendance data.
- This information comes in various forms, depending on an employee’s status.
- What are some pay schemes?
  - time cards for those paid on an hourly basis
  - self report for professionals
Validate Time and Attendance Data (Activity 3)

- straight commission or salary plus commission
- incentives and bonuses

**Procedures:**

- The payroll department is responsible for validating employee time records.
- For factory workers, validation involves comparing the total time worked with the time spent on each job.
Validate Time and Attendance Data (Activity 3)

- The payroll clerk calculates batch totals and enters them along with the time data.
- The batch totals are recalculated by the computer after subsequent processing steps.
- Payroll transaction data are entered through online terminals.
- Edit checks are performed on each time and attendance record.
Opportunities for Using Information Technology

- What are some opportunities of using information technology to validate time and attendance data (Activity 3)?
  - collecting employee time and attendance data electronically, instead of on paper documents
  - using badge readers
  - using electronic time clocks
Prepare Payroll (Activity 4)

- The fourth activity in the payroll cycle involves preparing payroll.
- Data about the hours worked are provided by the department in which the employee works.
- Pay rate information is obtained from the payroll master file.
- The person responsible for preparing paychecks cannot add new records to this file.
Prepare Payroll (Activity 4)

- Procedures:
  - Payroll processing is performed in the computer operations department.
  - The payroll transaction file is sorted by employee number.
  - The sorted time data file is used to prepare employee paychecks.
Prepare Payroll (Activity 4)

• All payroll deductions are summed and the total is subtracted from gross pay to obtain net pay.
• What are types of payroll deductions?
  – withholdings
  – voluntary deductions
• Finally, the payroll register and employee paychecks are printed.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>37884</td>
<td>Jarvis</td>
<td>40.0</td>
<td>6.25</td>
<td>250.00</td>
<td>35.60</td>
<td>18.75</td>
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<td>6.50</td>
<td>295.10</td>
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<td>Lincoln</td>
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<td>6.75</td>
<td>270.00</td>
<td>39.20</td>
<td>20.25</td>
<td>17.55</td>
<td>27.90</td>
<td>165.10</td>
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<tr>
<td>37887</td>
<td>Douglass</td>
<td>44.2</td>
<td>7.00</td>
<td>324.10</td>
<td>46.60</td>
<td>24.31</td>
<td>21.07</td>
<td>29.62</td>
<td>202.50</td>
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</table>

<table>
<thead>
<tr>
<th>Employee No.</th>
<th>Name</th>
<th>Health Ins.</th>
<th>Life Ins.</th>
<th>Retirement</th>
<th>Union Dues</th>
<th>Savings Bond</th>
<th>Total Misc.</th>
</tr>
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<tbody>
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<td>37884</td>
<td>Jarvis</td>
<td>10.40</td>
<td>5.50</td>
<td>7.50</td>
<td>4.20</td>
<td>0.00</td>
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<tr>
<td>37885</td>
<td>Burke</td>
<td>11.60</td>
<td>5.50</td>
<td>8.85</td>
<td>4.20</td>
<td>10.00</td>
<td>40.15</td>
</tr>
<tr>
<td>37886</td>
<td>Lincoln</td>
<td>10.40</td>
<td>5.20</td>
<td>8.10</td>
<td>4.20</td>
<td>0.00</td>
<td>27.90</td>
</tr>
<tr>
<td>37887</td>
<td>Douglass</td>
<td>10.20</td>
<td>5.50</td>
<td>9.72</td>
<td>4.20</td>
<td>0.00</td>
<td>29.62</td>
</tr>
</tbody>
</table>

**Figure 14-4** Sample payroll deduction registers
Opportunities for Using Information Technology

What are some opportunities of using information technology to prepare payroll (Activity 4)?

- produce and distribute payroll reports electronically rather than on paper
- online terminals
- corporate intranets
Disburse Payroll (Activity 5)

- The fifth activity is actual disbursement of paychecks to employees.
- Most employees are paid either by check or by direct deposit of the net pay amount into the employee’s bank account.
Disburse Payroll (Activity 5)

Procedures:

- Once paychecks have been prepared, the payroll register is sent to the accounts payable department for review and approval.
- A disbursement voucher is then prepared.
- The disbursement voucher and payroll register are then sent to the cashier.
Opportunities for Using Information Technology

- What are some opportunities of using information technology to *disburse payroll* (Activity 5)?
  - direct deposit
  - outsourcing to a payroll service bureau
Some payroll taxes and employee benefits are paid directly by the employer.

Federal and state laws require employers to contribute a specified percentage of each employee’s gross pay to federal and state unemployment compensation insurance funds.

Employers often contribute to health, disability, and insurance premiums.
Calculate Employer-Paid Benefits and Taxes (Activity 6)

- Many companies also offer their employees flexible benefit plans.
- Many employees are offered and contribute toward a choice of retirement savings plans.
Disburse Payroll Taxes and Other Deductions (Activity 7)

- The final activity in the payroll process involves paying the payroll tax liability and the other voluntary deductions of each employee.

- An organization must periodically prepare checks or use electronic transfer to pay the various tax liabilities incurred.
Disburse Payroll Taxes and Other Deductions (Activity 7)

- The timing of these payments is specified by the respective government agencies.
- The funds voluntarily withheld from each employee’s paycheck for various benefits must be disbursed to the appropriate organizations.
Learning Objective 2

Identify the major threats in the HRM/payroll cycle, and evaluate the adequacy of various internal control procedures for dealing with them.
Control Objectives, Threats, and Procedures

The second function of the AIS in the HRM/payroll cycle is to provide adequate internal controls to ensure meeting the following objectives:

1. payroll transactions are properly authorized
2. recorded payroll transactions are valid
3. authorized payroll transactions are recorded
4. payroll transactions are accurately recorded
5. applicable government regulations regarding remittance of taxes and filing of payroll and HRM reports are met
6. assets (both cash and data) are safeguarded from loss or theft
7. HRM/payroll cycle activities are performed efficiently and effectively
Control Objectives, Threats, and Procedures

- What are some threats?
  1. hiring of unqualified or larcenous employees
  2. violation of employment law
  3. unauthorized changes to the master payroll file
  4. inaccurate time data
  5. inaccurate processing of payroll
  6. theft or fraudulent distribution of paychecks
  7. loss or unauthorized disclosure of payroll data
  8. poor performance
What are some exposures?

- increased expenses
- lower productivity
- theft
- fines and civil suits
- inaccurate records and reports
- over/underpayment of employees
- reduced morale
Control Objectives, Threats, and Procedures

What are some control procedures?

– sound hiring practices (verification of job applicant’s skills, references, and employment history)
– thorough documentation of hiring procedures
– segregation of duties
– batch totals and other application controls
Control Objectives, Threats, and Procedures

- direct deposit
- paycheck distribution by someone independent of payroll process
- investigation of all unclaimed paychecks
- separate payroll checking account
- access control
- backup procedures
- encryption
<table>
<thead>
<tr>
<th>Process/Activity</th>
<th>Threat</th>
<th>Applicable Control Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiring and recruiting</td>
<td>1. Hiring unqualified or larcenous employees</td>
<td>Sound hiring procedures, including verification of job applicant’s skills, references and employment history</td>
</tr>
<tr>
<td></td>
<td>2. Violation of employment law</td>
<td>Thorough documentation of hiring procedures; training on current developments in employment law</td>
</tr>
<tr>
<td>Payroll processing</td>
<td>3. Unauthorized changes to payroll master file</td>
<td>Segregation of duties: HRM versus payroll and paycheck distribution; access controls; review of all changes</td>
</tr>
<tr>
<td></td>
<td>4. Inaccurate time data</td>
<td>Automation of data collection; various edit checks; reconciliation of time card data with job-time ticket data</td>
</tr>
<tr>
<td></td>
<td>5. Inaccurate processing of payroll</td>
<td>Batch totals and other application controls; payroll clearing account; review of IRS regulations</td>
</tr>
<tr>
<td></td>
<td>6. Theft or fraudulent distribution of paychecks</td>
<td>Direct deposit; paycheck distribution by someone independent of payroll process; investigation of unclaimed payroll</td>
</tr>
</tbody>
</table>

Table 14-2 Threats and Controls in the Payroll/HRM Cycle
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Inaccurate time data</td>
</tr>
<tr>
<td>5.</td>
<td>Inaccurate processing of payroll</td>
</tr>
<tr>
<td>6.</td>
<td>Theft or fraudulent distribution of paychecks</td>
</tr>
<tr>
<td></td>
<td>General</td>
</tr>
<tr>
<td>7.</td>
<td>Loss or unauthorized disclosure of data</td>
</tr>
<tr>
<td>8.</td>
<td>Poor performance</td>
</tr>
</tbody>
</table>
Learning Objective 3

Explain the key decisions that need to be made in the HRM/payroll cycle, and identify the information required to make those decisions.
Information Needs and Procedures

- The *third function* of the AIS is to provide information useful for decision making.
- The payroll system must be designed to collect and integrate cost data with other types of information in order to enable management to make the following kinds of decisions:
Information Needs and Procedures

1. Future work force staffing needs
2. Employee performance
3. Employee morale
4. Payroll processing efficiency and effectiveness
Information Needs and Procedures

- Some of the information has traditionally been provided by the payroll system.
- Other information, such as data about employee skills, had normally been provided and maintained by the HRM system.
- Other information, such as data about employee morale, has traditionally not been collected.
<table>
<thead>
<tr>
<th>Report Name</th>
<th>Contents</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative earnings register</td>
<td>Cumulative year-to-date gross pay, net pay, and deductions for each employee</td>
<td>Used for employee information and annual payroll reports</td>
</tr>
<tr>
<td>Workforce inventory</td>
<td>List of employees by department</td>
<td>Used in preparing labor-related reports for government agencies</td>
</tr>
<tr>
<td>Position control report</td>
<td>List of each authorized position, job qualifications, budgeted salary, and position status (filled or vacant)</td>
<td>Used in planning future workforce needs</td>
</tr>
<tr>
<td>Skills inventory report</td>
<td>List of employees and current skills</td>
<td>Useful in planning future workforce needs and training programs</td>
</tr>
<tr>
<td>Form 941</td>
<td>Employer’s quarterly federal tax return (showing all wages subject to tax and amounts withheld for income tax and FICA)</td>
<td>Filed quarterly</td>
</tr>
<tr>
<td>Form W-2</td>
<td>Report of wages and withholdings for each employee</td>
<td>Sent to each employee for use in preparing their individual tax returns; due by January 31</td>
</tr>
<tr>
<td>Form W-3</td>
<td>Summary of all W-2 forms</td>
<td>Sent to federal government along with a copy of all W-2 forms; due by February 28</td>
</tr>
<tr>
<td>Form 1099-Misc.</td>
<td>Report of income paid to independent contractors</td>
<td>Sent to recipients of income for use in filing their income tax returns; due by January 31</td>
</tr>
</tbody>
</table>
The Production Cycle
Chapter 13
Learning Objectives

1. Describe the major business activities and related data processing operations performed in the production cycle.
2. Explain how a company’s cost accounting system can help it achieve its manufacturing goals.
3. Identify major threats in the production cycle, and evaluate the adequacy of various control procedures for dealing with those threats.
Learning Objectives

4. Discuss the key decisions that need to be made in the production cycle, and identify the information needed to make those decisions.

5. Read and understand an REA data model of the production cycle.

6. Develop an REA data model for the production cycle.
Learning Objective 1

Describe the major business activities and related data processing operations performed in the production cycle.
The production cycle is a recurring set of business activities and related data processing operations associated with the manufacturing of products.

The *first function* of the AIS is to support the effective performance of the organization’s business activities.
Figure 13-1  Context diagram of the production cycle
Production Cycle Activities

- What are the four basic activities in the production cycle?
  1. Product design
  2. Planning and scheduling
  3. Production operations
  4. Cost accounting
Figure 13-2  Level 0 DFD of the production cycle
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.
What are two common methods of production planning?

1. Manufacturing resource planning (MRP-II)
   - MRP-II is an extension of materials resource planning that seeks to match existing production capacity and raw materials needs with forecasted sales demands.

2. Just-in-time (JIT) manufacturing systems
   - The goal of JIT is to minimize inventories of raw materials, work in process, and finished goods.
Planning and Scheduling (Activity 2)

- **Documents 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 production order authorizes manufacturing.
  - A materials requisition authorizes removal of materials from the storeroom to the factory.
**Figure 13-3** Sample master production schedule (MPS)

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Description:</th>
<th>VCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead time:*a</td>
<td>Week Number</td>
<td></td>
</tr>
<tr>
<td>1 week</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Quantity on hand</td>
<td>500</td>
<td>350&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Scheduled production</td>
<td>150&lt;sup&gt;c&lt;/sup&gt;</td>
<td>300</td>
</tr>
<tr>
<td>Forecasted sales</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Net available</td>
<td>350&lt;sup&gt;d&lt;/sup&gt;</td>
<td>350</td>
</tr>
</tbody>
</table>

*aTime to manufacture product (1 week for VCR).
*bEnding quantity on hand (net available) from prior week.
*cCalculated by subtracting quantity on hand from sum of this week’s and next week’s forecasted sales, plus a 50-unit buffer stock. For example, begin week 1 with 500 units. Projected sales for weeks 1 and 2 total 600 units. Adding 50-unit desired buffer inventory yields 650 units needed by end of week 1. Subtracting beginning inventory of 500 units results in planned production of 150 units during week 1.
*dBeginning quantity on hand plus scheduled production less forecasted sales.
### Alpha Omega Engineering

#### PRODUCTION ORDER

<table>
<thead>
<tr>
<th>Order No. 2289</th>
<th>Product No. 4430</th>
<th>Description: Cabinet Side Panel</th>
<th>Production Quantity 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved by:</td>
<td>Release Date: 02/24/2003</td>
<td>Issue Date: 02/25/2003</td>
<td>Completion Date: 03/09/2003</td>
</tr>
<tr>
<td>Delivered to:</td>
<td>Assembly Department</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Station No.</th>
<th>Product Operation No.</th>
<th>Quantity</th>
<th>Operation Description</th>
<th>Start Date &amp; Time</th>
<th>Finish Date &amp; Time</th>
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</thead>
<tbody>
<tr>
<td>MH25</td>
<td>100</td>
<td>1,003</td>
<td>Transfer from stock</td>
<td>02/28 0700</td>
<td>02/28 0800</td>
</tr>
<tr>
<td>ML15-12</td>
<td>105</td>
<td>1,003</td>
<td>Cut to shape</td>
<td>02/28 0800</td>
<td>02/28 1000</td>
</tr>
<tr>
<td>ML15-9</td>
<td>106</td>
<td>1,002</td>
<td>Corner cut</td>
<td>02/28 1030</td>
<td>02/28 1200</td>
</tr>
<tr>
<td>S28-17</td>
<td>124</td>
<td>1,002</td>
<td>Turn &amp; shape</td>
<td>02/28 1300</td>
<td>02/28 1700</td>
</tr>
<tr>
<td>F54-5</td>
<td>142</td>
<td>1,001</td>
<td>Finish</td>
<td>03/01 0800</td>
<td>03/01 1100</td>
</tr>
<tr>
<td>P89-1</td>
<td>155</td>
<td>1,001</td>
<td>Paint</td>
<td>03/01 1300</td>
<td>03/02 1300</td>
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<tr>
<td>QC94</td>
<td>194</td>
<td>1,001</td>
<td>Inspect</td>
<td>03/02 1400</td>
<td>03/02 1600</td>
</tr>
<tr>
<td>MH25</td>
<td>101</td>
<td>1,000</td>
<td>Transfer to assembly</td>
<td>03/02 1600</td>
<td>03/02 1700</td>
</tr>
</tbody>
</table>

**Explanation of numbers in Quantity column:**

1. Total of 1,003 sheets of raw material used to produce 1,000 good panels and 3 rejected panels.
2. One panel not cut to proper shape, thus only 1,002 units had operations 106 and 124 performed on them.
3. One panel not properly turned and shaped; hence only 1,001 panels finished, painted, and received final inspection.
4. One panel rejected during final inspection; thus only 1,000 good panels transferred to assembly department.

**Figure 13-4** Sample production order for AOE
Table 13-1  Example of “Exploding” a Bill of Materials

Step 1: Multiply the component requirements for ONE product by the number of products to be produced next period.
(from the MPS).

### Components in Each VCR

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Number of VCRs</th>
<th>Total Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>Control Unit</td>
<td>1</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>125</td>
<td>Back Panel</td>
<td>1</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>148</td>
<td>Side Panel</td>
<td>4</td>
<td>2,000</td>
<td>8,000</td>
</tr>
<tr>
<td>173</td>
<td>Timer</td>
<td>1</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>195</td>
<td>Front Panel</td>
<td>1</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>199</td>
<td>Screw</td>
<td>6</td>
<td>2,000</td>
<td>12,000</td>
</tr>
</tbody>
</table>

### Components in Each CD Player

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Number of CD Players</th>
<th>Total Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>Control Unit</td>
<td>1</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>120</td>
<td>Front Panel</td>
<td>1</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>121</td>
<td>Back Panel</td>
<td>1</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>173</td>
<td>Timer</td>
<td>1</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>190</td>
<td>Side Panel</td>
<td>4</td>
<td>3,000</td>
<td>12,000</td>
</tr>
<tr>
<td>199</td>
<td>Screw</td>
<td>4</td>
<td>3,000</td>
<td>12,000</td>
</tr>
</tbody>
</table>
Step 2: Calculate total component requirements by summing products.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>VCR</th>
<th>CD Player</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>0</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>105</td>
<td>2,000</td>
<td>0</td>
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<tr>
<td>120</td>
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</tr>
<tr>
<td>121</td>
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<td>3,000</td>
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</tr>
<tr>
<td>125</td>
<td>2,000</td>
<td>0</td>
<td>2,000</td>
</tr>
<tr>
<td>148</td>
<td>8,000</td>
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</tr>
<tr>
<td>173</td>
<td>2,000</td>
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<td>5,000</td>
</tr>
<tr>
<td>190</td>
<td>0</td>
<td>12,000</td>
<td>12,000</td>
</tr>
<tr>
<td>195</td>
<td>2,000</td>
<td>0</td>
<td>2,000</td>
</tr>
<tr>
<td>199</td>
<td>12,000</td>
<td>12,000</td>
<td>24,000</td>
</tr>
</tbody>
</table>

Step 3: Repeat steps 1 and 2 for each week during planning horizon.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
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<td>2,000</td>
<td>2,500</td>
<td>3,000</td>
<td>2,500</td>
<td>3,000</td>
</tr>
<tr>
<td>105</td>
<td>2,000</td>
<td>2,000</td>
<td>2,500</td>
<td>2,500</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>120</td>
<td>3,000</td>
<td>2,000</td>
<td>2,500</td>
<td>3,000</td>
<td>2,500</td>
<td>3,000</td>
</tr>
<tr>
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<td>2,500</td>
<td>3,000</td>
<td>2,500</td>
<td>3,000</td>
</tr>
<tr>
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<td>2,000</td>
<td>2,500</td>
<td>2,500</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>148</td>
<td>8,000</td>
<td>8,000</td>
<td>10,000</td>
<td>10,000</td>
<td>8,000</td>
<td>12,000</td>
</tr>
<tr>
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<td>5,000</td>
<td>5,500</td>
<td>4,500</td>
<td>6,000</td>
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<tr>
<td>190</td>
<td>12,000</td>
<td>12,000</td>
<td>10,000</td>
<td>12,000</td>
<td>10,000</td>
<td>12,000</td>
</tr>
<tr>
<td>195</td>
<td>2,000</td>
<td>2,000</td>
<td>2,500</td>
<td>2,500</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>199</td>
<td>24,000</td>
<td>20,000</td>
<td>25,000</td>
<td>27,000</td>
<td>22,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>
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)

- 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
Learning Objective 2

Explain how a company’s cost accounting system can help it achieve its manufacturing goals
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.
### MATERIALS REQUISITION

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit Cost ($)</th>
<th>Total Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>115</td>
<td>Calculator Unit</td>
<td>2,000</td>
<td>2.95</td>
<td>5,900.00</td>
</tr>
<tr>
<td>135</td>
<td>Lower Casing</td>
<td>2,000</td>
<td>.45</td>
<td>900.00</td>
</tr>
<tr>
<td>198</td>
<td>Screw</td>
<td>16,000</td>
<td>.02</td>
<td>320.00</td>
</tr>
<tr>
<td>178</td>
<td>Battery</td>
<td>2,000</td>
<td>.75</td>
<td>1,500.00</td>
</tr>
<tr>
<td>136</td>
<td>Upper Casing</td>
<td>2,000</td>
<td>.80</td>
<td>1,600.00</td>
</tr>
<tr>
<td>199</td>
<td>Screw</td>
<td>12,000</td>
<td>.02</td>
<td>240.00</td>
</tr>
</tbody>
</table>

**Total Cost:** 10,460.00

**Issued by:** AKL

**Received by:** GWS

**Costed by:** ZBD

---

*Note: Cost information is entered when the materials requisition is turned in to the cost accounting department. Other information, except for signatures, is printed by the system when the document is prepared.*

---

**Figure 13-5** Sample materials requisition for AOE
Figure 13-6  Sample move ticket for AOE

<table>
<thead>
<tr>
<th>MOVE TICKET</th>
<th>No. 8753</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production Order Number:</strong></td>
<td>2345</td>
</tr>
<tr>
<td><strong>From:</strong></td>
<td>Assembly</td>
</tr>
<tr>
<td><strong>KLS</strong></td>
<td><strong>NRC</strong></td>
</tr>
<tr>
<td><strong>Operation to Perform</strong></td>
<td><strong>Completed</strong></td>
</tr>
<tr>
<td>Clean</td>
<td>X</td>
</tr>
<tr>
<td>Polish</td>
<td></td>
</tr>
<tr>
<td>Package</td>
<td></td>
</tr>
<tr>
<td><strong>Comments:</strong></td>
<td></td>
</tr>
</tbody>
</table>
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)

- Workers can use code identification cards that run through a badge reader or barcode scanner when they start and finish any task.

- **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.
What minimum information should organizations keep about their fixed assets?

- identification number
- serial number
- location
- cost
- date of acquisition
- vendor name and address
- expected life
- expected salvage value
- depreciation method
- depreciation charges to date
- improvements
- maintenance services performed
Learning Objective 3

Identify major threats in the production cycle, and evaluate the adequacy of various control procedures for dealing with them.
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.
Control Objectives, Threats, and Procedures

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.
<table>
<thead>
<tr>
<th>Process/Activity</th>
<th>Threat</th>
<th>Applicable Control Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product design</td>
<td>1. Poor product design</td>
<td>Improved information about the effects of product design on costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Detailed data about warranty and repair costs</td>
</tr>
<tr>
<td>Planning and scheduling</td>
<td>2. Overproduction or underproduction</td>
<td>Better production planning systems</td>
</tr>
<tr>
<td></td>
<td>3. Suboptimal investment in fixed assets</td>
<td>Review and approval of fixed asset acquisitions; budgetary controls</td>
</tr>
<tr>
<td>Production operations</td>
<td>4. Theft or destruction of inventories and fixed assets</td>
<td>Restrict physical access to inventories and fixed assets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Document all movements of inventory through the production process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identification of all fixed assets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Periodic physical counts of inventory and fixed assets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proper documentation and review of all transactions involving disposal of fixed assets</td>
</tr>
<tr>
<td>Cost accounting</td>
<td>5. Recording and posting errors resulting in inaccurate cost data</td>
<td>Adequate insurance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data entry edit controls; use of barcode scanning where feasible;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reconciliation of recorded amounts with periodic physical counts</td>
</tr>
<tr>
<td>General threats</td>
<td>6. Loss of data</td>
<td>Backup and disaster recovery planning; restricting access to cost data</td>
</tr>
<tr>
<td></td>
<td>7. Poor performance</td>
<td>Improved and timelier reporting</td>
</tr>
</tbody>
</table>
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 exposures?
  - overproduction and excess inventories
  - obsolescence
  - underproduction, stockouts, and lost sales
  - excess investment in fixed assets
  - loss of assets
  - overstated inventory records
Control Objectives, Threats, and Procedures

– ineffective scheduling and planning
– decision errors
– increased expenses and taxes on fixed assets that are incorrectly valued
– ineffective decision making
– loss of customer goodwill and future sales
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
Learning Objective 4

Discuss the key decisions that need to be made in the production cycle, and identify the information needed to make those decisions.
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

What is a potential solution to the first criticism?
  – activity-based costing
Information Needs and Procedures

- **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.
  - ABC systems distinguish three separate categories of overhead.
Information Needs and Procedures

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