D217 – Accounting Information Systems
Updated Study Guide Notes

Course Overview

Accounting Information Systems (AIS for short) introduces students to AIS, with particular emphasis on the accountant's role in management and financial reporting systems. Topics include transaction cycles and related information technology (IT) controls, data management, enterprise resource planning (ERP) and e-commerce systems, systems development and acquisition, documentation, and IT auditing. D103 Intermediate Accounting I and D104 Intermediate Accounting II are the prerequisites to this course.

GREEN HIGHLIGHTS – STUDY GUIDE OBJECTIVES PER MODULE – note: the textbook info has been chosen for you

Course Overall Strategy

- € Work through each unit in Cengage/MindTap per the study guide instructions detailed by unit below.
- € Complete the chapter quizzes as you work through each unit.
- € There are 2 versions of the unit tests. Course instructors recommend taking one version as you work through each module. Going back through the Cengage/MindTap content will be necessary for some units. Based on your unit test results, consider adding an additional layer of detail to your student notes or progress to the next unit if you are satisfied with your level of competency.
- € Once you have been through all 6 units; take the second version of the Unit tests in one sitting to assess your PA readiness. Re-review Cengage/MindTap content and student notes as necessary.
- € Attempt the PA. Your CI will offer feedback on your PA results. Review feedback before progressing to OA.
- € Attempt the OA.

*Before I attempted the OA and after I did the PA:
- I reviewed the module that I was weak on and studied the areas using these notes AND the module quizzes.
- then I skimmed through the notes and module quizzes one more time, and watched cohort videos 1 more time.
Note: I felt like the 4th video wasn't sufficient before I even took the OA so I recommend reading Unit 6 and getting to know it.

UNIT 2: (Competency Weight 20%)
Overview of Accounting Information Systems – Complete the following activities:

- € Read/Listen to all the module content.
- € Take detailed notes for each learning objective below. You can copy and paste directly from Cengage/MindTap into Microsoft word.
- € Watch the cohort recording for An Accountant's Perspective: Accounting Information Systems - An Accountant's Perspective. The videos are not all inclusive and are meant to supplement (not replace) the readings.

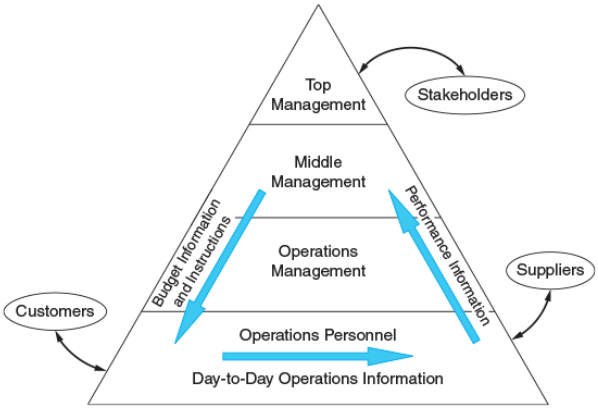
Competency: The graduate analyzes system components and transaction processes, using an accounting information system.

Module 1: You should be able to answer the following questions after studying this module: The student analyzes the components of information systems and their importance to accounting.

Recognize the primary information flows within the business environment.

D217 – Accounting Information Systems
Updated Study Guide Notes

Internal and External Flows of Information



Specific information objectives will differ from firm to firm as specific user needs vary. Three fundamental objectives are, however, common to all organizations:

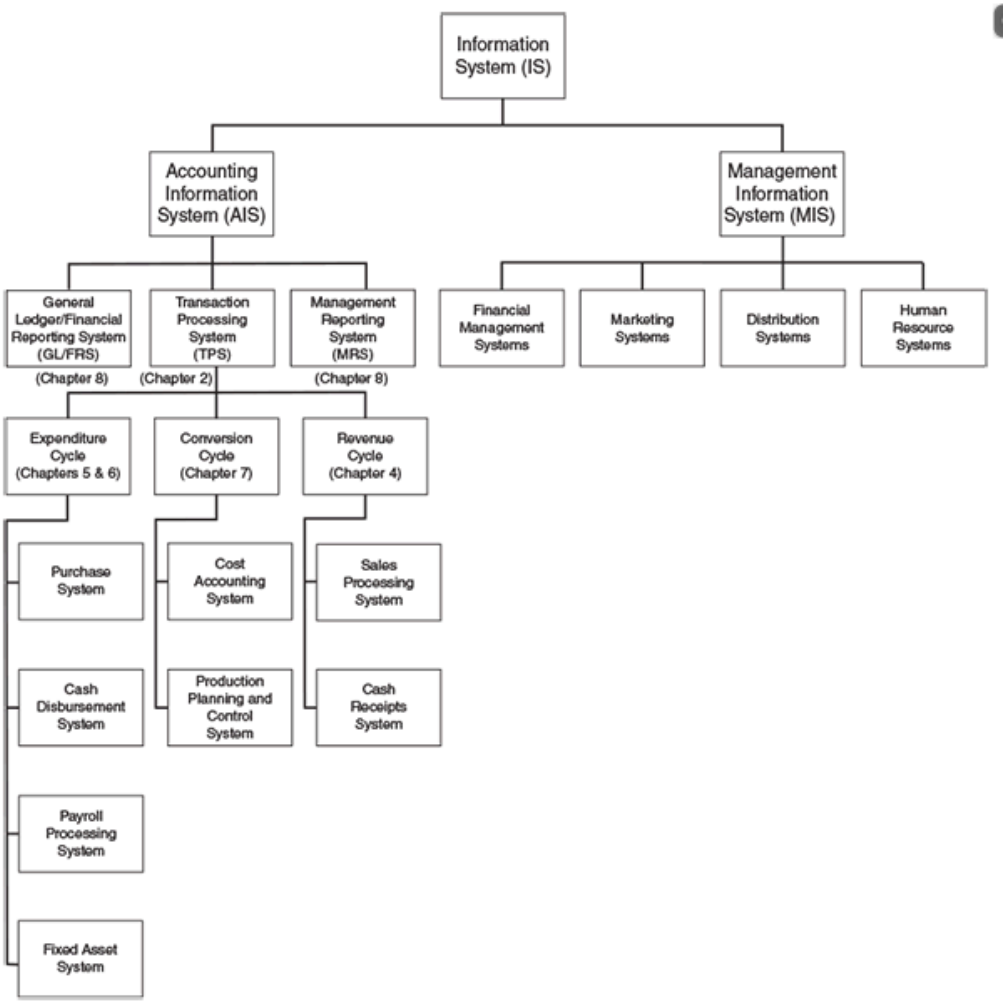
1. ***To support the firm's day-to-day operations.*** Operations personnel use information to assist them in the efficient and effective discharge of their daily tasks.
2. ***To support management decision making.*** Managers use information to assist them in planning and control decisions related to their areas of responsibility.
3. ***To support the stewardship function of management.*** Stewardship refers to managers' responsibility to properly manage the resources of the firm and to report on their activities. External users receive stewardship information through traditional financial statements and other mandated reports. Internally, managers receive stewardship information from various responsibility reports.

Differential between **accounting information systems (AIS)** and **management information systems (MIS)**

**** Memorize AIS structure**

D217 – Accounting Information Systems
Updated Study Guide Notes

2 A Framework for Information Systems



Differential between financial transactions and nonfinancial transactions. ****KNOW***

The distinction between AIS and MIS centers on the concept of a transaction. The information system accepts inputs, called **transactions**, which are converted through various processes into output information that goes to users. Transactions fall into two classes: financial transactions and nonfinancial transactions.

(AIS) processes financial transaction: an economic event that affects the assets and equities of the organization, is reflected in its accounts, and is measured in monetary terms.

D217 – Accounting Information Systems
Updated Study Guide Notes

- Transaction Processing System
- General Ledger/Financial Reporting Systems
  - **Nondiscretionary reporting** is a type of reporting in which the organization has few or no choices in the information it provides. Much of this information consists of traditional financial statements, tax returns, and other legal documents.
- Management Reporting System
  - **Discretionary reporting** is a type of reporting in which the organization can choose what information to report and how to present it.

(MIS) processes **Nonfinancial transactions**: events that do not meet the narrow definition of a financial transaction. For example, adding a new supplier of raw materials to the list of valid suppliers is an event that may be processed by the enterprise's information system as a transaction.

TABLE 1-1 EXAMPLES OF MIS APPLICATIONS IN FUNCTIONAL AREAS

Function	Examples of MIS Applications
Finance	Portfolio management systems Capital budgeting systems
Marketing	Market analysis New product development Product analysis
Distribution	Warehouse organization and scheduling Delivery scheduling Vehicle loading and allocation models
Personnel	Human resource management systems ■ Job skill tracking system ■ Employee benefits system

Identify the principal components of the general model for accounting information systems. ***KNOW***

This is a *general* model because it applies to all AIS, regardless of their underlying technologies.

Data Collection: first operational stage in Information system

Data Sources: financial transactions that enter the info systems from internal or external sources

Data Processing: group that manages the computer resources used to perform day to day processing of transactions

Database Management:

Data Attribute collection of attributes = record collection of record = file

Information Generation

Information generation is the process of compiling, arranging, formatting, and presenting information to users. Information can be an operational document such as a sales order, a structured report, or a message on a computer screen. Regardless of physical form, useful information has the following characteristics: relevance, timeliness, accuracy, completeness, and summarization.

D217 – Accounting Information Systems
Updated Study Guide Notes

Relevance: The contents of a report or document must serve a purpose. This could be to support a manager's decision or a clerk's task. We have established that only data relevant to a user's action have information content. Therefore, the information system should present only relevant data in its reports. Reports containing irrelevancies waste resources and may be counterproductive to the user. Irrelevancies detract attention from the true message of the report and may result in incorrect decisions or actions.

Timeliness: The age of information is a critical factor in determining its usefulness. Information must be no older than the time frame of the action it supports. For example, if a manager makes decisions daily to purchase inventory from a supplier based on an inventory status report, then the information in the report should be no more than a day old.

Accuracy: Information must be free from material errors. Materiality is, however, a difficult concept to quantify. It has no absolute value; it is a problem-specific concept. This means that, in some cases, information must be perfectly accurate. In other instances, the level of accuracy may be lower. A material error exists when the amount of inaccuracy in information causes the user to make poor decisions or to fail to make necessary decisions. We sometimes must sacrifice absolute accuracy to obtain timely information. Often, perfect information is not available within the user's decision time frame. Therefore, in providing information, system designers seek a balance between information that is as accurate as possible, yet timely enough to be useful.

Completeness: No piece of information essential to a decision or task should be missing. For example, a report should provide all necessary calculations and present its message clearly and unambiguously.

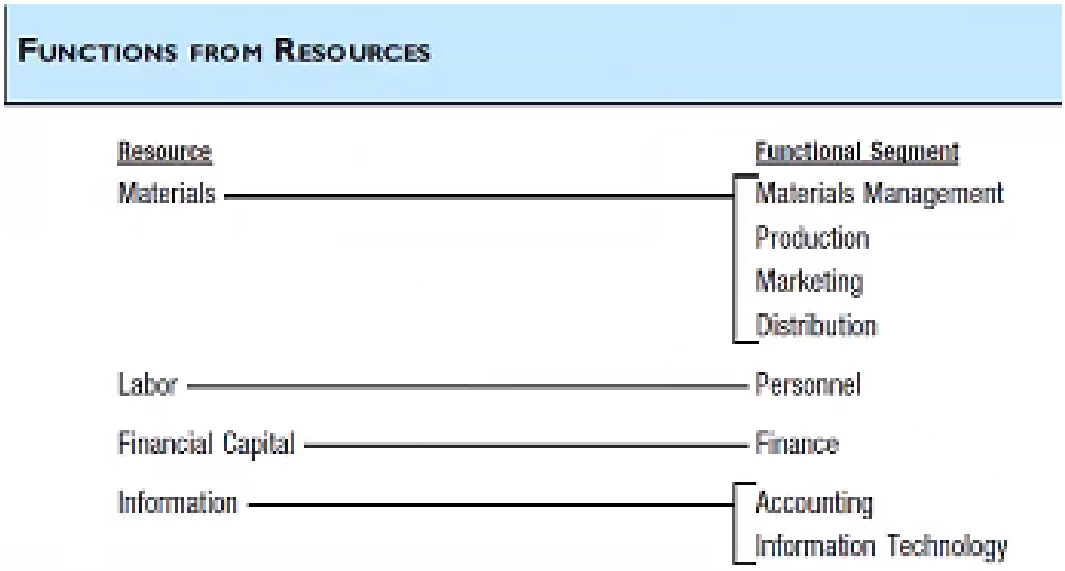
Describe how accounting information systems support the various functional areas of a business.

Segments of functional units of business organization:

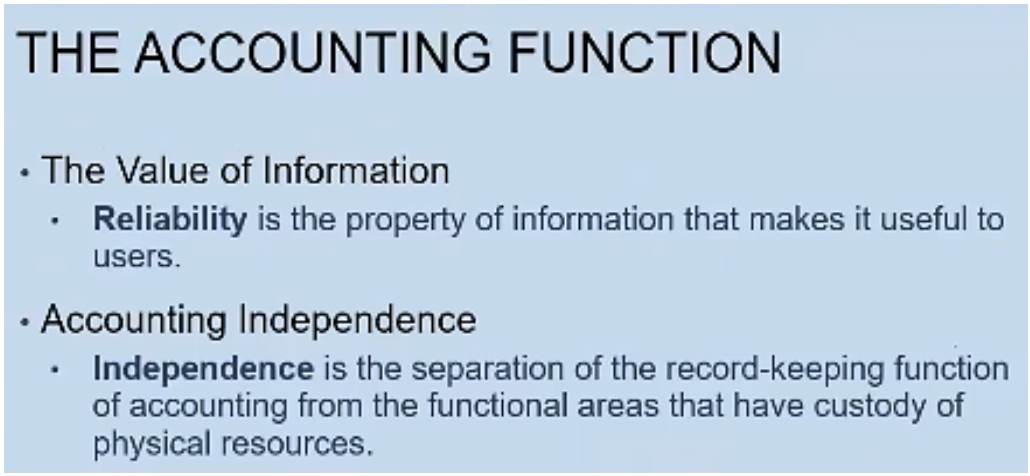
Materials Management: Purchasing, receiving, storage

Production: Planning of flow of materials, labor, and machinery.
Quality Control monitors manufacturing process.
Maintenance keeps machinery & facilities running in order.

Marketing
Distribution
Personnel
Finance



D217 – Accounting Information Systems
Updated Study Guide Notes



(1) **data processing**: centralized or distributed data processing (DDP)

(2) **systems development and maintenance:** The systems development function is the process by which organizations acquire information systems. The systems maintenance function is responsible for making changes to existing systems to accommodate changes in user needs.

(3) **database administration:** Centrally organized companies maintain their data resources in a central location that is shared by all authorized end users. In this shared data arrangement, a special independent group—database administration—headed by the database administrator is responsible for the security and integrity of the database.

(4) **network administration**: Network administration is responsible for the effective functioning of the software and hardware that constitute the organization's network. This involves configuring, implementing, and maintaining network equipment. In addition, network administration is responsible for monitoring network activity to ensure that the network is being used in accordance with company policies and that it is secure from attack by hackers from outside the organization as well as unauthorized individuals within the organization.

Differentiate between external auditing, internal auditing, and advisory services as they relate to accounting information systems. ****KNOW***

Role of accountants in AIS:

involved in both design & the audit of AIS.
Play a prominent role on systems development teams as domain experts
* The IT professionals on the team are responsible for the physical system

The most common audits are **external (attestation) audits, internal (operational) audits, and fraud audits.**

Attest Service versus Advisory Services
An important distinction needs to be made regarding the external auditor's attestation function and the rapidly growing field of advisory services, which many public accounting firms offer. Advisory services are

professional services offered by public accounting firms to improve their client organizations' operational efficiency and effectiveness. The domain of advisory services is intentionally unbounded so that it does not inhibit the growth of future services that are currently unforeseen.

The final section of this chapter examined **the dual roles of accountants as (1) designers of AIS and (2) auditors of AIS**. The IT function is responsible for designing the physical system, and the accounting function is responsible for specifying the conceptual system. An audit is an independent attestation performed by the auditor, who expresses an opinion about the fairness of a company's financial statements. A distinction was drawn between attestation and financial services. Both external and internal auditors conduct IT audits.

Auditor is an expert who expresses an opinion about the fairness of a company's financial statements.

Attest function is an independent auditor's responsibility to opine as to the fair presentation of a client firm's financial statement.

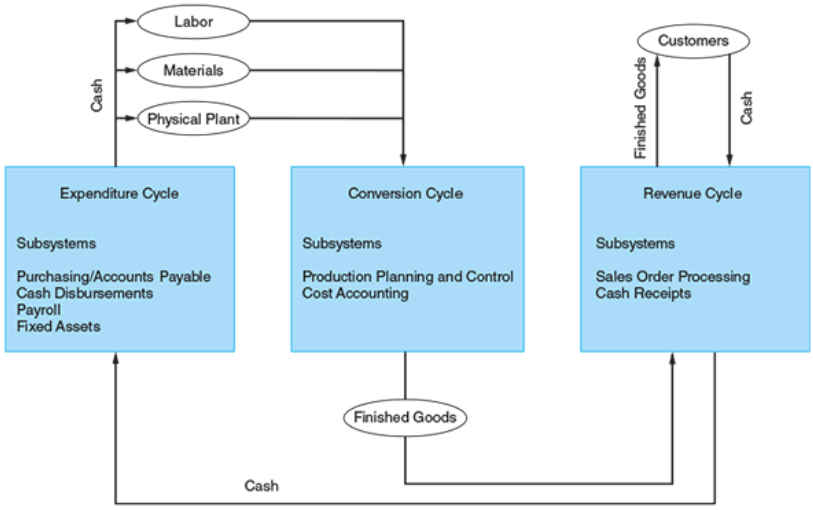
Substantive tests are tests that determine whether database contents fairly reflect the organization's transactions.

Attest Service versus Advisory Services

- **Tests of controls** are tests that establish whether internal controls are functioning properly.
- **IT auditing** is the review of the computer-based components of an organization. The audit is often performed as part of a broader financial audit.

Module 2: You should be able to answer the following questions after studying this module: The student analyzes the approaches to transaction processing in accounting information systems.

D217 – Accounting Information Systems
Updated Study Guide Notes



Recognize the types of transactions processed by each of the revenue and expenditure transaction cycles. ***KNOW***

1) incurs expenditures in exchange for resources **(expenditure cycle)**

i. **Purchases/accounts payable (AP) system**. This system recognizes the need to acquire physical inventory (such as raw materials) and places an order with the vendor. When the goods are received, the purchases system records the event by increasing inventory and establishing an account payable to be paid at a later date.

ii. **Cash disbursements system**. When the obligation created in the purchases system becomes due, the cash disbursements system authorizes the payment, disburses the funds to the vendor, and records the transaction by reducing the cash and accounts payable accounts.

iii. **Payroll system**. The payroll system collects labor usage data for each employee, computes the payroll, and disburses paychecks to the employees. Conceptually, payroll is a special-case purchases and cash disbursements system. Because of accounting complexities associated with payroll, most firms have a separate system for payroll processing.

iv. **Fixed asset system**. A firm's fixed asset system processes transactions pertaining to the acquisition, maintenance, and disposal of its fixed assets. These are relatively permanent assets that collectively often represent the organization's largest financial investment. Examples of fixed assets are land, buildings, furniture, machinery, and motor vehicles.

(2) provides value added through its products or services (conversion cycle).

The conversion cycle comprises two major subsystems: the production system and the cost accounting system. The production system involves the planning, scheduling, and control of the physical product through the manufacturing process. This includes determining raw material requirements, authorizing the work to be performed and the release of raw materials into production, and directing the movement of the work-in-process through its various stages of manufacturing. The cost accounting system monitors the flow of cost information including labor, overhead, and raw materials related to production. Information this system produces is used for inventory valuation, budgeting, cost control, performance reporting, and management decisions, such as make-or-buy decisions

(3) receives revenue from outside sources (revenue cycle).

i. **Sales order processing**. The majority of business sales are made on credit and involve tasks such as preparing sales orders, granting credit, shipping products (or rendering of a service) to the customer, billing customers, and recording the transaction in the accounts (accounts receivable, inventory, expenses, and sales).

ii. **Cash receipts**. For credit sales, some period of time (days or weeks) passes between the point of sale and the receipt of cash. Cash receipts processing includes collecting cash, depositing cash in the bank, and recording these events in the accounts (accounts receivable and cash).

Explain the flowcharting techniques used for documenting accounting information systems and transaction cycles.

Digital data storage:

Master File: A master file contains account data. The general ledger and subsidiary ledgers are examples of master files. Data values in master files are updated (changed) by transactions.

Transaction File: A transaction file is a temporary file of transaction records used to update data in a master file. Sales orders, inventory receipts, and cash receipts are examples of transaction files. The actual file update process is explained later in the chapter.

Reference File: A reference file stores data that are used as standards for processing transactions. For example, the payroll program may refer to a tax table to calculate the proper amount of withholding taxes for payroll transactions. Other reference files include price lists used for preparing customer invoices, lists of authorized suppliers, employee rosters, customer credit history files for approving credit sales, and freight charges used for calculating the cost of shipments to customers.

File Structures:

flat files approach – associated with legacy systems (large mainframe system from 1960s to 1970s)

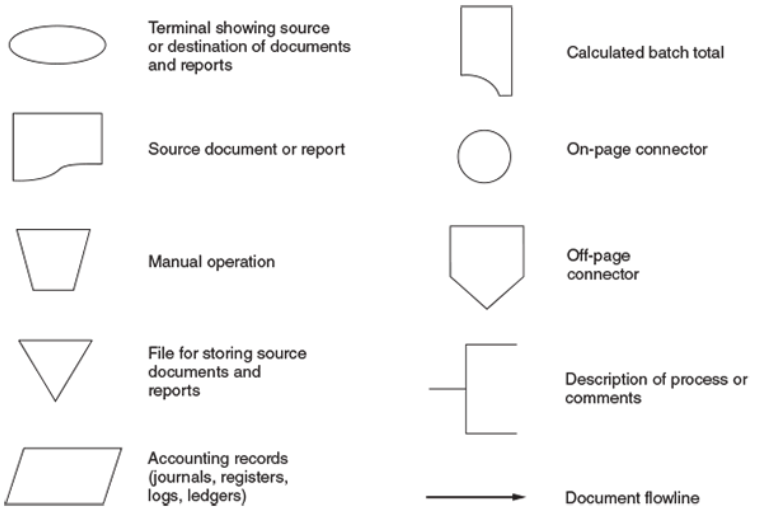
databases – data system since 1960s

System Flowcharts: graphical representation of the *physical* relationships among key elements of a system.

Flowcharting Manual Activities: ******KNOW***

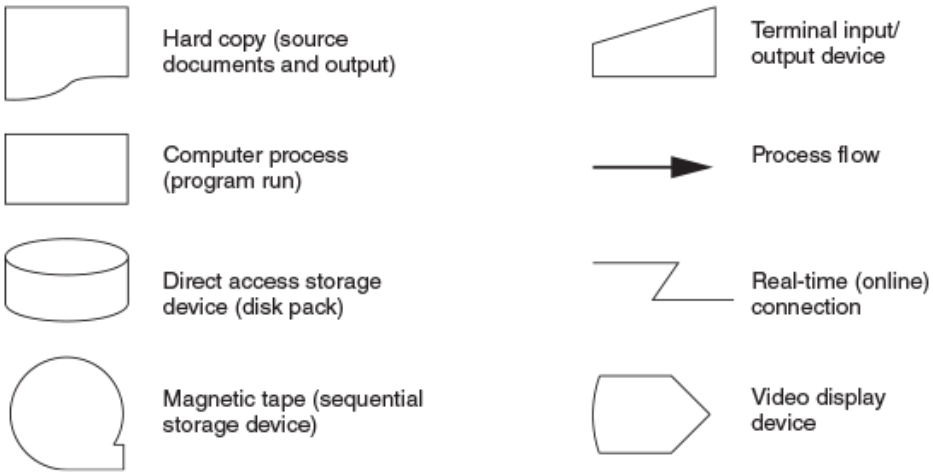
a) Lay out the Physical Areas of Activity**:** a flowchart reflects the physical system, which is represented as vertical columns of events and actions separated by lines of demarcation
b) Transcribe written facts into visual format
c) for visual clarity, system flowcharts show the processing of a single transaction only.

D217 – Accounting Information Systems
Updated Study Guide Notes



Flowcharting Computer Process:

a) create a template that depicts the areas of activity (still the vertical . Ie. Difference is that manual flowchart has a credit department and computer process has a computer operations department.
b) transcribe written facts into visual format



Differentiate between batch and real-time processing and the effect of these technologies on transaction processing.

batch systems assemble transactions into groups for processing, a time lag will always exist between the point at which an economic event occurs and the point at which it is processed by the system and reflected in the firm's accounts. The length of lag (minutes or weeks) depends on the frequency of batch processing. For example, payroll processing is typically a batch system with long lag times. batch systems demand fewer organization resources (such as programming costs, computer time, and user training) than real-time systems. Batch processing of noncritical accounts, however, improves operational efficiency by eliminating unnecessary activities at critical points in the process.

Real-time systems process transactions individually at the moment the event occurs; therefore, no time lags exist between occurrence and processing. On the other hand, a large portion of total programming costs for real-time systems are incurred in designing user interfaces. Real-time systems must be user-friendly, forgiving, and easy to work with. Real-time processing of large volumes of transactions can create operational inefficiencies.

D217 – Accounting Information Systems
Updated Study Guide Notes

Explain data coding schemes used in accounting information systems.

Sequential Coding: represents items in some sequential order (ascending or descending). Alpha Numeric is common.
Advantage: supports batch reconciliations (ie. Sales orders) at the end of process, detects gaps in sequence.
Disadvantages: codes carry no information beyond their order in sequence, difficult to change, difficult to renumber, inappropriate for grouped records logically where additions and subtractions occur regularly.

****KNOW*** **Block Codes:** A variation on sequential coding that partly remedies the disadvantages just described. Can be used to represent whole classes of items by restricting each class to a specific range withing the coding scheme. Common application for block coding is the construction of *Chart of Accounts* – basis of General Ledger.
Advantage: Block coding allows for the insertion of new codes within a block without having to reorganize the entire coding structure
Disadvantage: As with the sequential codes, the information content of the block code is not readily apparent

Group Codes: Numeric group codes are used to represent complex items or events involving two or more pieces of related data. The code consists of zones or fields that possess specific meaning.
Advantages: Group codes have a number of advantages over sequential and block codes.

-They facilitate the representation of large amounts of diverse data.
-They allow complex data structures to be represented in a hierarchical form that is logical and more easily remembered by humans.
-They permit detailed analysis and reporting both within an item class and across different classes of items.

Disadvantages: group codes can effectively present diverse information, they tend to be overused. Unrelated data may be linked simply because it can be done. This can lead to unnecessarily complex group codes that cannot be easily interpreted. Finally, overuse can increase storage costs, promote clerical errors, and increase processing time and effort.

Alphabetic codes are used for many of the same purposes as numeric codes. Alphabetic characters may be assigned sequentially (in alphabetic order) or may be used in block and group coding techniques.
Advantages: The capacity to represent large numbers of items is increased dramatically through the use of pure alphabetic codes or alphabetic characters embedded within numeric codes (**alphanumeric codes**).
Disadvantages: The primary drawbacks with alphabetic coding are
(1) as with numeric codes, there is difficulty rationalizing the meaning of codes that have been sequentially assigned
(2) users tend to have difficulty sorting records that are coded alphabetically.

Mnemonic Codes: alphabetic characters in the form of acronyms and other combinations that convey meaning.
Advantages: The mnemonic coding scheme does not require the user to memorize meaning; the code itself conveys a high degree of information about the item that is being represented.
Disadvantages: Although mnemonic codes are useful for representing classes of items, they have limited ability to represent items within a class

UNIT 3: (Competency Weight 20%)
Transaction cycles and business processes – Complete the following activities:

- € Read/Listen to all the module content.
- € As you go through the module content take detailed notes for each learning objective below. You can copy and paste directly from Cengage/MindTap into Microsoft word.
- € Watch the cohort recording for the expenditure cycle: Accounting Information Systems - Expenditures - Chapter 5 & Accounting Information Systems - Expenditures - Chapter 6 The videos are not all inclusive and are meant to supplement (not replace) the readings.

Competency: The graduate explains the processes and controls for the revenue, expenditure, and general ledger transaction cycles used in business information systems.

D217 – Accounting Information Systems
Updated Study Guide Notes

In Unit 3, you will review the concepts of key business tasks and internal controls involved in each of the major transaction cycles. You will learn about the transaction cycles, which include revenues, expenditures, fixed assets, payroll, and the general ledger. You will learn more about system flowcharting and how it is used to document the transaction cycle processing flows in each of these major transaction cycles. You will also learn about how system flowcharting is used to identify areas of strengths and opportunities for improvement.

Module 3: You should be able to answer the following questions after studying this module: The student identifies the business processes and the controls required in the revenue cycle.

- Recognize the fundamental tasks performed in the revenue cycle, regardless of the technology in place.
- Identify the functional departments involved in revenue cycle activities to trace the flow of revenue transactions through the organization.
- Specify the documents, journals, and accounts that provide audit trails, promote the maintenance of historical records, support internal decision-making, and sustain financial reporting.

the revenue cycle is the direct exchange of finished goods or services for cash in a single transaction between a seller and a buyer. More complex revenue cycles process sales on credit. Many days or weeks may pass between the point of sale and the subsequent receipt of cash. This time lag splits the revenue transaction into two phases:

(1) the physical phase, involving the transfer of assets or services from the seller to the buyer
(2) the financial phase, involving the receipt of cash by the seller in payment of the accounts receivable.

the revenue cycle actually consists of two major *subsystems*:
(1) the sales order processing subsystem
(2) the cash receipts subsystem.

There are 2 primary sections of revenue cycle: Conceptual & Physical

i. CONCEPTUAL: key activities include logical tasks, sources & uses of information, and movement of accounting information through organization.

Sales Order Procedure: receiving and processing a customer order, filling the order and shipping products to the customer, billing the customer at the proper time, and correctly accounting for the transaction

- **Receive Order:** a) customer order – type, quantity
  b) transcribe customer order to sales order – name, address, acct#, order info (#, unit price, description)
  c) file until there's updates and changes. Employees can refer to customer orders as reference when customer inquires
- **Check credit:** an authorization control and should be performed as a function separate from the sales activity. In our conceptual system, the receive order task sends the sales order (credit copy) to the check credit task for approval. The returned approved sales order then triggers the continuation of the sales process by releasing sales order information simultaneously to various tasks.
- **Pick Goods:** a) picking ticket/stock release issued to pick goods at warehouse.
  b) Then sends verified stock release to ship goods task.
  c) Back order record is kept on file until inventory is stocked.
  d) warehouse adjusts stock records to reduce inventory.
- **Ship Goods:** receives packing slip & shipping notice before goods are sent to shipping.
  a) once goods are received, shipper reconciles physical items with stock release, packing slip, and shipping notice
  b) Bill of lading is prepared (contract with seller & shipper)
  c) once shipped, shipper updates a shipping log
  d) shipping notice and stock release forwarded to customer *function* as proof of shipment & updates customer order file.
- **Bill Customer:** billing occurs after notification from shipping is received. Items are reconciled using shipping notice and order. Unit prices, taxes, and freight are added to invoice.

a) Sales Invoice is generated with all above info
b) Sales Journal used for recording completed sales transactions using info from sales invoice
c) at the end of the period, entries are summarized in sales journal voucher then sent to General Ledger task for posting to A/R account

In Addition, the billing function performs the following record-keeping tasks:
- Sends the stock release document to the update inventory records task.
- Forwards the ledger copy of the sales order to the update accounts receivable task.
- Records the sale in the sales journal.

- **Update Inventory Record:** inventory control *function* updates inventory subsidiary ledger account from information contained in stock release document.
- **Update Accounts Receivable:** Customer records in the A/R subsidiary ledgers are updated from the info provided by sales order (ledger copy).
- **Post to Ledger:** General Ledger *function* receives journal vouchers from billing & inventory control task + account summary from A/R *function*. GL uses journal vouchers to post to respective accounts. (ie. Debit AR & COGS, Credit Inventory & Sales). GL reconciles using the 2 documents.

Sales Return Procedure When a return is necessary, the buyer requests credit for the unwanted products. This involves reversing the previous transaction in the sales order procedure

- **Prepare Return Slip:** receiving department counts, inspects & prepares return slip. Goods along with copy of slip is returned to warehouse to be restocked. A copy of return slip is sent to sales *function* to prepare credit memo.
- **Prepare Credit Memo:** authorization needed and forwarded to manager
- **Authorize Credit Memo**: manager evaluates and approves credit.
- **Update Sales Journal:** the transaction is recorded in the sales journal as a contra entry. The credit memo is then forwarded to the inventory control function for posting
- **Update Inventory & AR:** The inventory control function adjusts the inventory records and forwards the credit memo to accounts receivable, where the customer's account is also adjusted.
- **Update GL:** Upon receipt of the journal voucher and account summary information, the general ledger function reconciles the figures and posts updates/changes to control accounts.

Cash Receipts Procedure

- **Open Mail & Remittance List:** A mail room employee opens envelopes containing customers' payments and *remittance advices*.
  - Mail room personnel route the checks and remittance advices to an administrative clerk who endorses the checks "For Deposit Only" and reconciles the amount on each remittance advice with the corresponding check.
  - **Record & Deposit Check:** After reconciling the prelist to the checks, the employee records the check in the *cash receipts journal*.
- Bank **deposit slip** created showing the amount of the day's receipts and forwards this along with the checks to the bank. At the end of the day, the cash receipts employee summarizes the journal entries and sends a journal voucher with the following entry to the general ledger function.
- **Update AR records:** The remittance advices are used to post to the customers' accounts in the AR subsidiary ledger.
- **Update GL:** Upon receipt of the journal voucher and the account summary, the general ledger function reconciles the figures, posts to the cash and AR control accounts, and files the journal voucher.

- **Reconcile Receipts & Deposits:** Periodically, a clerk from the **controller's** office (or an employee not involved with the cash receipts procedures) reconciles cash receipts by comparing the following documents: a copy of the prelist, deposit slips received from the bank, and related journal vouchers.

ii. PHYSICAL – all physical systems are composed, to varying degrees, of technology & human activity.

- **Mail Room:**
  i) Mail room clerk opens the envelopes containing the checks and remittance advices and endorses the checks for deposit only.
  ii)The clerk then reconciles the checks and remittances advices and prepares a remittance list. The checks, remittance advices, and a copy of the remittance list are sent to the cash receipts department.
- **Cash Receipts Department:** cash receipts clerk reconciles the checks and the remittance advices with the remittance list and prepares deposit slips. Via terminal, the clerk accesses the cash receipts system and creates a record in the remittance file (cash receipts journal) for each remittance advice received. The clerk files the remittance list, remittance advices, and one copy of the deposit slip. At the end of the day, a member of the security group deposits the checks in the bank.
- **Automatic Data Processing Procedures:** When the cash receipts data entry is complete, the system automatically performs the following tasks:
  - Closes the sales invoices that are covered by the customer checks by placing the customer check number and payment date in the invoice record.
  - Posts to the GL accounts.
  - Prepares and distributes various management reports, including transaction listings, discrepancy (out of balance) reports, and general ledger change reports.
- **Controller's Office:** a clerk in the controller's office periodically performs a reconciliation of remittance lists, bank deposit slips, cash receipts journals, and the GL cash accounts

Recognize the risks associated with the revenue cycle and the controls that reduce those risks.

internal control activities as consisting of two major categories:

(1) physical controls: These consist of six classes of internal control activities: transaction authorization, segregation of duties, supervision, accounting records, access control, and independent verification (physical control). The purpose of physical controls is to control the actions of people
(2) information technology (IT) controls.: IT controls comprise general controls and application controls – ie. POS system. Computer application controls consist of: input controls, processing controls, and output controls

Risk of Selling to Un-Creditworthy Customers
Selling on credit to customers who have not been properly vetted can lead to excessive bad debt losses. This risk is more apparent in organizations whose sales staff are compensated on a commission basis.

Identify the operational and control implications of technology used to automate and reengineer the revenue cycle.

- **Doing Business via EDI (electronic data interchange (EDI)** is a technology devised to expedite routine transactions between manufacturers and wholesalers, and between wholesalers and retailers. The customer's computer is connected to the seller's computer via a private network or the Internet. When the customer's computer system detects the need to order inventory, it automatically transmits a purchase order (customer order) to the seller. The seller's system receives the customer order and processes it automatically. This system employs little or no human involvement
  Disadvantages: EDI poses unique control problems for organizations. One problem is ensuring that, in the absence of explicit authorization, only valid transactions are processed. Another risk is that a trading partner, or someone masquerading as a trading partner, will access the firm's accounting records in a way that is unauthorized by the trading partner agreement

D217 – Accounting Information Systems
Updated Study Guide Notes

Module 4: You should be able to answer the following questions after studying this module: The student identifies the business processes and the controls required in the expenditure cycle for purchases and cash disbursements.

- Recognize the fundamental tasks that constitute the purchases and cash disbursements process.
- Identify the functional areas involved in purchases and cash disbursements activities to trace the flow of these transactions through the organization.
- Specify the documents, journals, and accounts that provide audit trails, promote the maintenance of historical records, and support internal decision-making and financial reporting.

Most business entities operate on a credit basis and do not pay for resources until after acquiring them. The time lag between these events splits the procurement process into two phases:
(1) the physical phase, involving the acquisition of the resource, and
(2) the financial phase, involving the disbursement of cash.

two major subsystems that constitute the expenditure cycle:
(1) the purchases processing subsystem and
(2) the cash disbursements subsystem.

CONCEPTUAL: sequence of activities through the purchases processing and cash disbursements procedures. focus is on what (conceptually) needs to be done, not how (physically) it is accomplished.

- **Purchases Processing Procedures:** Manufacturing firms purchase raw materials for production, and their purchasing decisions are authorized by the production planning and control function. Merchandising firms purchase finished goods for resale. The inventory control function provides the purchase authorization for this type of firm.
    - **Monitor Inventory Records:** inventory is depleted through production process (conversion cycle) & selling goods (revenue cycle). Prepare purchase requisition and send to Purchase order function. Purchase requisition contains routine ordering information taken from the inventory subsidiary ledger and *valid vendor file (a control).*
    - **Prepare Purchase Order:** purchase requisition is received, and a Purchase Order is prepared by vendor. Copy of Purchase Order is sent to Accounts Payable & Received Goods *function*
    - **Receive Goods:** Goods arriving are reconciled with the blind copy of the PO. The purpose of the blind copy is to force the receiving clerk to count and inspect inventories prior to completing the receiving report. Upon the completion of the physical count and inspection, the receiving clerk prepares a *receiving report*. Copies of receiving report sent to raw materials storeroom or finished goods warehouse, open/closed PO file, AP pending file, and inventory control.
    - **Update Inventory Records:** Inventory subsidiary ledger updated. Organizations using *standard cost system* carry their inventories at a predetermined standard value regardless of actual price paid and only need quantities.
    - **Set up Accounts Payable:** copies of PO & receiving report receiving. Obligation of goods has incurred (realized) but defer recording (recognizing) liability until supplier's invoice has been received.
        - ***KNOW When invoice arrives, AP clerk reconciles using receiving report & PO in A/P pending file (three-way match: order was received & fairly priced).
        - ***KNOW Once reconciled is complete, *AP packet (invoice, PO, receiving report)* is prepared & used as formal authority to record liability & make a payment
        - Transaction is recorded in purchases journal & posted to supplier's account in AP subsidiary ledger
- **Vouchers Payable System:** As an alternative to the AP procedures described in the previous section, some firms use a *vouchers payable system.* Under this system, the AP department uses cash disbursement vouchers and maintains a *voucher register.* After the AP clerk performs the three-way match, he or she

prepares a cash disbursement voucher to approve payment. Vouchers provide improved control over cash disbursements and allow firms to consolidate several payments to the same supplier on a single voucher, thus reducing the number of checks written

- **Post to Ledger:** The general ledger function receives a journal voucher from the AP department and an account summary from inventory control.
  - The general ledger function posts the data contained in the journal voucher to the inventory and AP control accounts and reconciles the inventory control account with the inventory subsidiary summary.
  - The journal voucher is then filed in the approved journal voucher file. With this step, the purchases phase of the expenditure cycle is completed.

- **Cash Disbursement System:** The cash disbursements system processes the payment of obligations created in the purchases system. The principal objective of this system is to ensure that only valid creditors receive payment and that amounts paid are timely and correct.
  - **Identify Liabilities** Due: Cash disbarment process begins in AP dept where AP clerk reviews AP files due for payment. Clerk sends payment approval in form of *AP packet* to cash disbursement dept.
  - **Prepare Cash Disbursement:** documents are reviewed for completeness & accuracy. A check is prepared & records (check #, $ amount, etc) in *check register* aka *cash disbursement journal*
  - **Update AP Record:** AP packet received, AP clerk removes liability from vendor's AP subsidiary ledger account. AP packet filed in closed AP file. Account summary is prepared & sent to GL function
  - **Post to GL:** receives journal voucher from cash disbursements & AP account summary. Once reconciliation is complete, GL is updated accordingly & approved journal voucher is filed.

PHYSICAL SYSTEMS:

Basic Tech Expenditure Cycle:

- **Inventory Control:** clerk print *purchase requisition* from their PC. Copies sent to purchasing dept & hard copy placed in open purchasing requisition file.
- **Purchasing Dept:** clerk records requisition in open PO file & prints multipart PO for vendor. Copy sent to vendor, copy sent to inventory control, copy sent to AP. Blind copy sent to receiving dept.
- **Receiving:** receiving clerk reconciles goods rec'd from vendor with packing slip. Receiving clerk adds digital record to receiving report file & prints multipart hard-copy receiving report. A copy accompanies physical inventory to storeroom, a copy sent to purchasing dept for reconciliation & filing, a copy goes to inventory control for digital inventory subsidiary ledger (removes on order flag) & filing, a copy goes to AP dept for pending file, a blind copy PO & packing slip filed in receiving dept.
- **AP Dept:** AP clerk reconciles invoice, PO, receiving report (three way match) & prepares AP packet. Clerk records transaction in digital journal & posts liability to supplier's subsidiary ledger AP account. Clerk then files ap packet in open AP file.
- **GL Dept:** GL clerk reconciles journal voucher & account summary. Clerk posts to inventory & AP accounts to complete the purchase phase of expenditure cycle.

Basic Tech Cash Disbursement System:

- **AP Dept:** clerk reviews AP packets & sends to cash disbursement dept.
- **Cash Disbursement Dept:** clerk receives AP packets & reviews document for completeness & accuracy.
  - Clerk prepares three part check & records information to check register
  - Check & supporting documents goes to cash disbursement manager or treasurer for signature
  - Check mailed to supplier, clerk returns AP packet & check copy to AP dept
  - Clerk summarizes entries made to check register & sends journal voucher to GL dept
- **AP Dept:** AP clerk removes liability (debit vendor AP subsidiary record) & file AP packet. Clerk sends AP summary to GL dept
- **GL Dept:** GL dept clerk posts to GL control account using journal voucher from cash disbursement dept & account summary from AP. Then, file.

D217 – Accounting Information Systems
Updated Study Guide Notes

INTEGRATED PURCHASES PROCESSING SYSTEM:

the traditional department structure still exists in advanced technology environments, personnel responsibilities are refocused on financial analysis and exception-based problem-solving, rather than on day-to-day clerical tasks. As a result, these departments are smaller and more efficient than their basic technology counterparts.

- **Computer Operations:**

1. The system reads the purchases requisition file for items that need to be replenished. The requisitions are then sorted by the vendor and matched against the valid vendor file for vendor address and contact information.
2. Hard-copy purchase orders are prepared and sent to the vendor.
3. A record is added to the open PO file.
4. A digital transaction listing of POs is created, which is downloaded by the purchasing agent, reviewed, and filed in the department.

- **Receiving Department:**

1. A record is added to the receiving report file.
2. Quantities of items received are matched against the open PO record, and the PO is closed by placing the receiving report number in the PO closed flag.
3. The inventory subsidiary records are updated to reflect the receipt of the inventory items.
4. The general ledger inventory control account is updated.

Accounts Payable department: When the AP clerk receives the supplier's invoice, the clerk accesses the system and adds a record to the vendor invoice file. The clerk then files the hard-copy invoice in the department. The following tasks are performed automatically by the system:

1. Using the PO number as a common attribute, the system links the vendor invoice to the associated purchase order and receiving report records.
2. The system reconciles the supporting documents and creates a virtual AP packet to authorize payment.
3. The system displays the virtual AP packet on the AP clerk's computer screen for review. The virtual AP packet allows the AP clerk to browse the supporting documents and modify documents if necessary to reconcile quantity or price discrepancies that may exist.
4. Assuming no discrepancies that demand the AP clerk's intervention, the system automatically approves payment and sets a payment due date.

INTEGRATED CASH DISBURSEMENTS SYSTEM: Organizations that use electronic funds transfer (EFT) to transmit payments employ different procedures. Each day, the DUE DATE fields of the vendor invoice records are scanned for items due to be paid. The following procedures are performed on items that are due:

1. Checks are automatically printed, signed, and distributed to the mail room for mailing to vendors. Checks above a preset materiality threshold will receive additional signatures prior to being mailed.
2. The payments are automatically recorded in the check register file.
3. Vendor invoices are closed by placing the check number in the closed flag field.
4. The general ledger AP control and cash accounts are updated.
5. Reports detailing these transactions are transmitted via a terminal to the AP and cash disbursements departments for management review and filing.

- Identify operational features and the control implications of technologies used in purchases and cash disbursements systems.
- Recognize the risks associated with purchases and cash disbursements activities in order to be familiar with the controls that reduce these risks.

D217 – Accounting Information Systems
Updated Study Guide Notes

internal control activities consist of

(1) **physical control** is to control the actions of people. These consist of six classes of internal control activities: *transaction authorization, segregation of duties, supervision, accounting records, access control, and independent verification*.

(2) **IT controls** comprise *general controls and application controls*. General controls are not specific to a particular cycle or subsystem and thus do not apply to expenditure cycle risks directly. Computer application controls consist of input controls, processing controls, and output controls.

Risk of unauthorized inventory purchases: Excessive inventories tie up the organization's cash reserves, and stock-outs cause lost sales and manufacturing delays. Furthermore, such discretion can lead to frauds such as kickbacks to purchasing agents from unapproved suppliers who charge above-market prices for their inventory.

- (**Physical Control) Transaction Authorization:** ensures only valid transactions are processed. Inventory control formally authorizes replenishments with purchase requisition to trigger purchasing function.
- (**IT Control) Automated purchase approval:** The objective of automated purchase approval is to prevent unauthorized purchases from unapproved vendors. Managers can override to purchase from unapproved vendors.

Risk of Receiving Incorrect items, quantities, or damaged goods: The receiving department is responsible for inspecting and counting large quantities of valuable assets that arrive from vendors. Once inspected, a receiving report is prepared and the inventories are stored in the warehouse. Failure to perform the receiving task correctly places the firm at risk of accepting incorrect items, incomplete orders, and damaged goods.

- (**Physical Control)**
  - **Independent Verification:** receiving clerk uses blind copy PO to verify goods type & quantity received
  - **Supervision:** ensures clerks properly carry out important duties.
- (**IT Control) Scanner Technology:** Product code scanners in receiving dept & warehouse reduces risk of human error

Risk of Inaccurately Recording transactions in journals & ledgers:

- **(Physical Control)**
  - **Transaction Authorization:** AP function authorizes cash disbursements via AP packet.
  - **Accounting Records:** maintain an audit trail adequate for tracing transactions from its source document to financial statements. Routine accounting records, expenditure cycle systems must be designed to provide supporting information, such as the purchase requisition file, the PO file, and the receiving report file. By reviewing these peripheral files, auditors may obtain evidence of inventory purchases that have not been recorded as liabilities.
  - **Independent Verification:** GL function verifies the total obligations recorded equal the total inventories received & total reductions in A/P equal the total disbursement of cash.
- (**IT Controls)**
  - **Input data edits:** Input controls are edits that focus on the integrity of transaction data being entered into the application.
  - **Error Messages:** Mismatch conditions should produce error messages to computer operator
  - **Automated Postings to Subsidiary and GL Accounts:** a computer application, which is not subject to human failings such as yielding to situational pressures and/or lacking ethical standards, decides which accounts to update and by how much. By eliminating the human element from accounting activities, the potential for errors and opportunities for fraud are significantly reduced.
  - **File Back up:** daily process that need to be in place

Risk of Misappropriation of Cash & Inventory: Misappropriation of cash may take the form of fraudulent payments to individuals posing as vendors. It may also involve erroneous payments for items not ordered or not received

- **(Physical Controls)**
  - **Supervision:** Inadequate supervision can create an environment conducive to the theft of inventories in transit.
  - **Independent Verification:** three-way match (verification of PO, receiving report, invoice)
  - **Segregation of duties – inventory control from warehouse:** Inventory control keeps the detailed records of the asset, while the warehouse (stores) has asset custody. These tasks should be kept separate.
  - **Segregation of duties – A/P from Cash Disbursements** An individual with combined responsibilities for establishing accounts payable and for writing checks to vendors in payment of accounts payable could perpetrate a fraud against the firm.
- **(IT Controls)**
  - **Automated three-way match & payment approval:** Through the virtual AP packet screen, management may view the supporting documents and exercise an override of the system controls to force payment. The override should be performed only by authorized management and should be fully documented in management reports.
  - **Multilevel security:** This is a programmed technique that allows multiple individuals to simultaneously access a system, but provides segregation of duties to limit their access privileges and activities

Risk of Unauthorized Access to Accounting Records & Reports

- **(Physical Control)**
  - **Access Control:** A firm must limit access to documents that control its physical assets. With the proper supporting documents, a fraudulent transaction can be made to look legitimate to the system and could be paid.
  - **Segregation of Duties:** *The organization should be so structured that the perpetration of a fraud requires collusion between two or more individuals.* The more people involved in a task, the more difficult it is to collude and greater the risk of detection. This will have a deterrent effect on those contemplating fraud.
- **(IT controls)**
  - **Password Control:** organization management should implement a robust password control policy to prevent unauthorized access to computer files and programs that reside in each of the departments. The application logic should require, and prompt, users to change passwords periodically. Corporate policy should require strong passwords of six or eight characters that consist of both alphabetic and numeric characters
  - **Multilevel security:** programmed techniques that permit simultaneous access to a central system by many users with different access privileges, but prevents them from obtaining information for which they lack authorization. Two methods for achieving multilevel security are the access control list (ACL) and role-based access control (RBAC)

EDI

EDI technology was devised to expedite routine transaction processing between manufacturers, wholesalers, and retailers by connecting buyer and seller computers via a private network or the Internet. A key element of successful EDI is the implementation of a trading partner agreement to eliminate the discrepancies that require human involvement to resolve, EDI poses unique risks for organizations that need to be recognized and controlled. One of them is ensuring that, in the absence of explicit authorization, only valid transactions are processed. Another risk is that a trading partner, or someone masquerading as a trading partner, will access the firm's accounting records in a way that is unauthorized by the trading partner agreement

D217 – Accounting Information Systems
Updated Study Guide Notes

Module 5: You should be able to answer the following questions after studying this module: The student identifies the business processes and the controls required in the expenditure cycle for payroll processing and fixed asset procedures.

- Recognize the fundamental tasks that constitute the payroll and fixed asset processes.
- Identify the functional departments involved in payroll and fixed asset activities to trace the flow of these transactions through the organization.
- Specify the documents, journals, and accounts that provide audit trails, promote the maintenance of historical records, and support internal decision-making and financial reporting.

CONCEPTUAL PAYROLL SYSTEM: ***KNOW*

Payroll System General Tasks:

- **Personnel Dept:** The personnel department prepares and submits *personnel action forms* to the *prepare payroll* function. These documents identify employees authorized to receive a paycheck and are used to reflect changes in hourly pay rates, payroll deductions, and job classification.
- **Production Dept:** Production employees prepare two types of time records: job tickets and time cards.
  Job tickets capture the time that individual workers spend on each production job. Cost accounting uses these documents to allocate direct labor charges to work-in-process (WIP) accounts.
  Time cards capture the time the employee is at work. These are sent to the prepare payroll function for calculating the amount of the employee's paycheck
- **Update Work In Process (WIP) Account:** Once labor costs are updated in WIP account, *labor distribution summary (summary of labor costs in WIP acct)* is prepared and forwarded to *general ledger function*
- **Prepare Payroll:** A clerk in the payroll department then performs the following tasks:

  (1) Prepares the *payroll register*, showing gross pay, deductions, overtime pay, and net pay.
  (2) Enters this information into the *employee payroll records*
  (3) Prepares employee paychecks
  (4) Sends the *paychecks* to the *distribute paycheck* function.
  (5) Files the *time cards*, personnel action form, and copy of the *payroll register* (not shown).

- **Distribute Paycheck:** To prevent fraud, many companies use a paymaster to distribute paychecks to employees. This individual is independent of the payroll process—not involved in payroll authorization or preparation tasks. If a valid employee does not claim a paycheck, the paymaster returns the check to payroll. The reason the check went unclaimed can then be investigated.
- **Prepare A/P:** AP
  - clerk reviews payroll register for correctness & prepares copies of cash disbursement voucher for the total amount of payroll.
  - Clerk records voucher in voucher register & submits the voucher packet (voucher & payroll register) to prepare cash disbursement function. A copy is sent to GL function for update.
- **Prepare Cash Disbursement:** single check for entire amount of payroll is prepared & deposited to *payroll imprest account.* (employee paychecks are drawn from account before paychecks can be cashed)
  - clerk sends copy of check with disbursement voucher & payroll register to AP dept.
  - Journal voucher is prepared and sent to update GL function.
- **Update General Ledger:** GL function receives labor distribution summary from cost accounting, the disbursement voucher from A/PT, and journal voucher from cash disbursement. With these information, the

GL clerk updates debit & credits for respective accounting entries, then file documents.

From the Labor Distribution Summary		
	DR	**CR**
Work-in-Process (Direct labor)	XXX.XX	
Factory Overhead (Indirect labor)	XXX.XX	
Wages Payable		XXX.XX
From Disbursement Voucher		
	DR	**CR**
Wages Payable	XXX.XX	
Cash		XXX.XX
Federal Income Tax Withholdings Payable		XXX.XX
State Income Tax Withholdings Payable		XXX.XX
FICA Income Tax Withholdings Payable		XXX.XX

PHYSICAL PAYROLL SYSTEM: ****KNOW*

Basic Technology Payroll System:

1. Personnel action and time and attendance information from the personnel and production departments, respectively, initiate the payroll process.
2. The payroll department reconciles this information, calculates the payroll, and sends the paychecks to the paymaster for distribution to employees.
3. Cost accounting receives information regarding the time spent on each job from production. This is used for posting to accounts in the WIP subsidiary ledger.
4. Accounts payable receives payroll summary information (payroll register) from the payroll department and authorizes the cash disbursements department to deposit a single check, in the amount of the total payroll, in a bank imprest account on which the payroll is drawn.
5. The general ledger department reconciles summary information from cost accounting and accounts payable. GL accounts are updated to reflect these transactions

Advanced Technology Payroll System:

For moderate-sized and large organizations, payroll processing is often integrated within the human resource management (HRM) system. The HRM system captures and processes a wide range of personnel-related data, including employee benefits, labor resource planning, employee relations, employee skills, internal training, personnel actions (pay rates, deductions, etc.), and payroll processing. HRM systems provide real-time access to personnel files for purposes of direct inquiries and making changes in employee status as they occur.

- **Human Resources:** HR clerk enters data into employee records file in real time from terminals.
- **Cost Accounting:** Cost Accounting dept enter job cost data in real time to create *labor usage file*
- **Employee Timekeeping:** several technologies can update time & attendance file can be updated in multiple locations (ie. Telecommuting employees).
    - **Biometric clocks** – verify employees' identities by using fingerprint or handvein scan tech. This device uses mathematical algorithm for verification instead of fingerprints
    - **Magnetic Swipe ID cards** – employees can be issued a card that has magnetic strip containing employee info. Employee swipes card through time clock record to start/end time on job.
    - **Proximity Cards –** works similar to swipe cards but don't need to swipe. Card can be placed in front of a reader to record attendance time. The advantage is card can be read through wallets/purses.
    - **Mobile remote devices –** employees can clock in using handheld devices (tablet/phone) or web browsers from laptop.

- **Data Processing:** At the end of the work period, the following tasks are performed in a *batch* process:

1. Labor costs are distributed to various WIP, overhead, and expense accounts.
2. An online labor distribution summary file is created. Copies of the file are accessible from terminals in the cost accounting and general ledger departments.
3. Payroll is calculated, and an online payroll register is created from the time and attendance; file and the employee records file. The payroll register file is accessible from the AP and cash disbursements departments.
4. The employee records file is updated.
5. Paychecks are prepared, signed, and distributed to the employees.
6. Funds sufficient to cover the full amount of the payroll are transferred to the payroll imprest account, and the transfer is recorded in the check register.
7. Digital journal vouchers are entered into the journal voucher file. The system automatically updates the general ledger from the journal voucher and labor distribution summary files.

o Recognize the risks associated with payroll and fixed asset activities as well as the controls that reduce these risks.
o Identify the operational features and the control implications of technology used in **payroll**

Risk of Inaccurately Recording Transactions:

(Physical Control)

- **Accounting Records:** maintain audit trail adequate for tracing a transaction from its source document to financial statements. Payroll audit trail includes:
  1. Time cards, job tickets, and disbursement vouchers.
  2. Journal information, which comes from the labor distribution summary and the payroll register.
  3. Subsidiary ledger accounts, which contain the employee records, WIP, and various expense accounts.
  4. The GL accounts, which contain payroll control, cash, and the payroll clearing (imprest) account.

- **Independent Verification:** Examples of Independent Verification:
  1. **Time and Attendance.** Before submitting time cards to payroll, the supervisor must verify their accuracy and sign them.
  2. **Accounts Payable.** The AP clerk verifies the accuracy of the payroll register before creating a disbursement voucher that transfers funds to the imprest account.
  3. **General Ledger.** The general ledger department provides verification of the overall process by reconciling the labor distribution summary and the payroll disbursement voucher.

(IT Control)

- **Data Input Edits:** Input controls verify the integrity of transaction data being entered into the application. If errors are /not detected before being processed, these errors will corrupt the master files of the system
  - **Error Messages:** Any mismatch when posting time card or personnel action data to employee records should produce an error message to the computer operator.
  - **File Back up:** Backup procedures need to be in place to reduce the risk of data loss due to file destruction and/or corruption.
  - **Automated Posting to Accounts:** Eliminating the human element reduces the potential for errors and significantly improves efficiency of operations.

Risk of Misappropriation of Cash through Payroll Fraud

Payroll frauds come in two general forms:

1. The first is the nonexistent employee who receives a paycheck.
2. The second type of payroll fraud involves overpayment of an employer

(Physical Control)

- **Transaction Authorization:** The personnel action form helps payroll keep current the employee records.

- **Segregation of Duties:** ***KNOW***
  - The timekeeping function and the personnel function should be separated.
  - accounts payable the responsibility of reviewing the work done by payroll (payroll register) and approving payment. Based on this approval, the cash disbursements function then writes a single check to cover the entire payroll. The individual employee paychecks are not negotiable instruments until the payroll check is deposited into the imprest account at the bank.
  - The use of an independent paymaster to distribute checks (rather than the employee's supervisor) helps verify the existence of employees.
- **Supervision:** Sometimes, employees clock in for another worker who is late or absent. Supervisors should observe the timekeeping process and reconcile the time cards with actual attendance.
- **Access Control:** maintaining controls over access to all journals, ledgers, employee data, and source documents in the payroll system is important, as it is in all transaction processing systems.
  (IT Control)
  1. Limit tests to detect excessive hours reported per period.
  2. Biometric scanners, swipe cards, and PINs reduce the risk of payroll fraud by ensuring that individuals clocking into the system are valid employees.
  3. Automated tests to validate employee time cards against a valid and up-to-date employee file.
  4. Paycheck direct deposit options for employees.

Risk of Unauthorized Access to Payroll Records & Confidential Employee Data:
Payroll information is at risk to unauthorized access from outsiders as well as employees of the organization.
(IT Control)
- **Passwords**
- **Multilevel Security**

Advantages & Risk of Associated with Payroll Outsourcing
The primary advantage of payroll outsourcing is cost savings. By transferring this function to a third party, the client organization avoids the salaries and benefit costs of running an in-house payroll department. Also, the cost of continuing education for payroll staff is a financial burden.
One risk is that the service provider organization will have access to extremely confidential employee data and to the client firm's financial resources. Another risk is that the service provider may fail to perform. Its controls may be materially flawed and/or it may act incompetently in a way that allows material errors or fraud to occur

Identify the operational features and the control implications of technology used in **fixed asset systems**. ***KNOW***

LOGICAL FIXED ASSET SYSTEM

Fixed assets are the property, plant, and equipment used in the operation of a business. These are relatively permanent items that often collectively represent the largest financial investment by the organization. The process involves three categories of tasks: asset acquisition, asset maintenance, and asset disposal.

Asset Acquisition:

1. Departmental manager (user) recognizing the need to obtain a new asset or replace an existing one. Authorization and approval procedures over the transaction will depend on the asset's value. Department managers typically have the authority to approve purchases below a certain materiality limit. Capital expenditures above the limit will require approval from the higher management levels. This may involve a formal cost-benefit analysis and the formal solicitation of bids from suppliers.

2. Once the request is approved and a supplier is selected, the fixed asset acquisition task is similar to the expenditure cycle procedures with two noteworthy differences.

i. First, the receiving department delivers the asset into the custody of the user/manager rather than a central store or warehouse.
ii. Second, the fixed asset department, not inventory control, performs the record-keeping function

Asset Maintenance: involves adjusting the fixed asset subsidiary account balances as the assets (excluding land) depreciate over time or with usage. Depreciation charges from assets not used in manufacturing are treated as expenses in the current period. Depreciation calculations are transactions that the fixed asset system must be designed to anticipate internally when no external event (source document) triggers the action. An important record used to initiate this task is the ***depreciation schedule.***
Asset maintenance also involves adjusting asset accounts to reflect the cost of physical improvements that increase the asset's value or extend its useful life. Such enhancements, which are themselves capital investments, are processed as new asset acquisitions
Each subsidiary record should indicate the current location of the asset. The ability to locate and verify the physical existence of fixed assets is an important component of the audit trail.

Asset Disposal: begins when the responsible manager issues a request to dispose of the asset. Like any other transaction, the disposal of an asset requires proper approval. The disposal options open to the firm are to sell, scrap, donate, or retire the asset in place. A disposal report describing the final disposition of the asset is sent to the fixed asset accounting department to authorize its removal from the ledger.

PHYSICAL FIXED ASSET SYSTEM:

Acquisition Procedures: Process begins when fixed asset accounting clerk receives a receiving report & cash disbursement voucher.
(1) Clerk creates record of asset in fixed asset subsidiary ledger (incl useful life, salvage value, depreciation method, asset's location)
(2) The fixed asset system automatically updates the fixed asset control account in the general ledger and prepares journal vouchers for the general ledger department as evidence of the entry.
(3) system prepares a depreciation schedule for each asset when its acquisition is originally recorded. The schedule is stored on computer disk to permit future depreciation calculations

Asset Maintenance: The fixed asset system uses the depreciation schedules to record end-of-period depreciation transactions automatically. The specific tasks include
(1) calculating the current period's depreciation,
(2) updating the accumulated depreciation and book value fields in the subsidiary records,
(3) posting the total amount of depreciation to the affected GL accounts (depreciation expense and accumulated depreciation), and
(4) recording the depreciation transaction by adding a record to the journal voucher file.
Finally, a fixed asset depreciation report is sent to the fixed asset department for review.

Disposal Procedures: When the clerk deletes the record from the fixed asset subsidiary ledger, the system automatically
(1) posts an adjusting entry to the fixed asset control account in the general ledger,
(2) records loss or gain associated with the disposal, and
(3) prepares a journal voucher.
A fixed asset status report containing details of the deletion is sent to the fixed asset department for review.

D217 – Accounting Information Systems
Updated Study Guide Notes

FIXED ASSET SYSTEM RISKS & CONTROLS

Authorization Controls: each transaction should be initiated by a written request from the user or department. Should be formal and explicitly authorized.
Supervision Controls: supervisors must ensure that fixed assets are being used in accordance with the organization's policies and business practices
Independent Verification Controls: internal auditor should review the asset acquisition and approval procedures to determine the reasonableness of factors used in such decisions. The internal auditor should verify the location, condition, and fair value of the organization's fixed assets against the fixed asset records in the subsidiary ledger. In addition, depreciation charges calculated on fixed assets should be reviewed and verified for accuracy.

Module 6: You should be able to answer the following questions after studying this module: The student describes how the financial reporting systems are related to the management reporting systems.

- Describe the operational features of the general ledger system (GLS), financial reporting system (FRS), and management reporting system (MRS).
- Identify data analytics concepts and techniques.

******KNOW***

GENERAL LEDGER SYSTEM: Transaction cycles process individual events that are recorded in special journals and subsidiary accounts. Summaries of these transactions flow into the GLS and become sources of input for the MRS and FRS. The bulk of the flows into the GLS comes from the transaction processing subsystems. Note, however, that information also flows from the FRS as feedback into the GLS

Journal Voucher: can be used to represent summaries of similar transactions or a single unique transaction, identifies the financial amounts and affected general ledger (GL) accounts. Routine transactions, adjusting entries, and closing entries are all entered into the GL via journal vouchers. Because a responsible manager must approve journal vouchers, the manager offers a degree of control against unauthorized GL entries.

GLS DATABASE:

- **GL Master File:** principal file in GLS Database & based on organizations *Chart of Accounts*
  - Each record in GL Master is either a separate GL account (ie. Sales) or Control Account (ie. AR – Control) for a corresponding subsidiary ledger in TPS
  - FRS draws upon GL master to produce financial statements
  - MRS uses this file to support internal information reporting
- **GL ledger history file:** same format as GL master. Provides historical financial date for comparative financial reports
- **Journal voucher file**: collection of journal vouchers processed in current period. It provides a record of all GL transactions & replaces traditional general journal
- **Journal voucher history file:** contains journal vouchers for past periods. Current & historical journal voucher files are important links in firm's audit trail.
- **Responsibility Center file:** contains revenues, expenditures, and other resource utilization data for each responsibility center in organization. MRS draws upon this data.
- **Budget master file:** contains budgeted amounts for revenues, expenditures, and other resources for responsibility centers.

GLS Procedures:
Financial Reporting system: law dictates management's responsibility for providing stewardship information to external parties which is met via FRS. Much of the information provided takes the form of standard financial statements, tax returns, and documents required by regulatory agencies such as the Securities and Exchange Commission (SEC).

D217 – Accounting Information Systems
Updated Study Guide Notes

- **Sophisticated Users with Homogeneous Information needs:** it is assumed that users of financial reports understand the conventions and accounting principles that are applied and that the statements have information content that is useful.
- Financial reporting is final step in overall accounting process that begins in Transaction Cycles.

The process begins with a clean slate at the start of a new fiscal year. Only the balance sheet (permanent) accounts are carried forward from the previous year. From this point, the following steps occur:

1. ***Capture the transaction*.** Within each transaction cycle, transactions are recorded in the appropriate transaction file.
2. ***Record in special journal*.** Each transaction is entered into the journal. Recall that frequently occurring classes of transactions, such as sales, are captured in special journals. Those that occur infrequently are recorded in the general journal or directly on a journal voucher.
3. ***Post to subsidiary ledger*.** The details of each transaction are posted to the affected subsidiary accounts.
4. ***Post to general ledger*.** Periodically, journal vouchers, summarizing the entries made to the special journals and subsidiary ledgers, are prepared and posted to the GL accounts. The frequency of updates to the GL will be determined by the degree of system integration.
5. ***Prepare the unadjusted trial balance***. At the end of the accounting period, the ending balance of each account in the GL is placed in a worksheet and evaluated in total for debit-credit equality.
6. ***Make adjusting entries*.** Adjusting entries are made to the worksheet to correct errors and to reflect unrecorded transactions during the period, such as depreciation.
7. ***Journalize and post adjusting entries*.** Journal vouchers for the adjusting entries are prepared and posted to the appropriate accounts in the GL.
8. ***Prepare the adjusted trial balance***. From the adjusted balances, a trial balance is prepared that contains all the entries that should be reflected in the financial statements.
9. ***Prepare the financial statements*.** The balance sheet, income statement, and statement of cash flows are prepared using the adjusted trial balance.
10. ***Journalize and post the closing entries*.** Journal vouchers are prepared for entries that close out the income statement (temporary) accounts and transfer the income or loss to retained earnings. Finally, these entries are posted to the GL.
11. ***Prepare the postclosing trial balance***. A trial balance worksheet containing only the balance sheet accounts may now be prepared to indicate the balances being carried forward to the next accounting period.

<u>COSO CONTROL ISSUES:</u>

- **Transaction Authorization:** *journal voucher* authorizes an entry to GL. JV have numerous resources such as cash receipts processing, sales order processing and financial report group. It's vital to the integrity of accounting records for JV to be properly authorized by managers at source department.
- **Segregation of Duties:** GL provides as verification control for accounting process so the GL task must be separate from all other responsibilities in the organization. Individuals who have access to GL accounts:
    - Should not have recordkeeping responsibility for special journals or subsidiary ledgers
    - Should not prepare journal vouchers
    - Should not have custody of physical assets
    - *note: real time GL/FRS system: detailed listings of journal voucher & account activity reports provided to end users since actions are automated
- **Access Controls:** SOX legislation requires organizations to implement controls that limit database access to authorized individuals only.
- **Accounting Records:** The audit trail is a record of the path that a transaction takes through the input, processing, and output phases of transaction processing. An audit trail facilitates error prevention and correction when the data files are logically organized. Also, the general ledger and other files that constitute the audit trail should be detailed and rich enough to
  (1) provide the ability to answer inquiries, for example, from customers or vendors;
  (2) be able to reconstruct files if they are completely or partially destroyed;
  (3) provide historical data required by auditors;

(4) fulfill government regulations; and
(5) provide a means for preventing, detecting, and correcting errors.

- **Independent Verification:** The FRS produces two operational reports—journal voucher listing and the GL change report—that provide proof of the accuracy of this process. The *journal voucher listing* provides relevant details about each journal voucher posted to the GL. *The general ledger change report* presents the effects of journal voucher postings to the GL accounts
- **IT Application Controls:**
  - Input controls in the form of edits and check digits ensure that data (journal vouchers) entering the general ledger are free from data entry errors that can corrupt GL accounts.
  - Process controls, such as error messages, passwords, and multilevel security, serve the same objectives in the GLS as they do in transaction processing applications.
  - Output controls need to be in place to ensure that financial statements and other management reports produced by the FRS arrive at their intended destinations

Internal Control Implications of XBRL

- **Taxonomy Creation:** can be generated incorrectly and results in incorrect mapping between data & taxonomy elements that could result in misrepresentation of financial data. Controls must be designed and put in place to avoid errors.
- **Taxonomy Mapping Error:** Correctly generated XBRL tags may be incorrectly assigned to internal database accounts resulting in misrepresentation of financial data. Therefore, a control must be put in place.
- **Validation of Instance Documents:** Once mapping and tags are complete & stored in internal database, XBRL instance docs/reports can be generated. Independent verification procedures need to be established to ensure appropriate taxonomy & tags have been applied before posting to web server.

BIG DATA ANALYTICS: Introduced in 1941. Defined by 3 V's:

- **Volume:** most associated with big data. Often involves terabytes, petabytes, and exabytes of data. Contains data such as customers sales records, voice & text log files, stored images, speech to text data from call recordings. Top users are marketing, executive, management, and finance. Top industries are Healthcare, Insurance, Financial Services, Energy, Horizontal, Forecasting world events.
- **Velocity:** speed of big data that's analyzed. Cloud computing is a popular option as it has capabilities & resource to store and power thousands of servers.
- **Variety:** primary driver of volume. 80% of big data are unstructured and derived from audio, video, timeseries data, realtime streaming data, external web data, external social media & a wide variety of data supplied by vast & growing array of IoT (Internet of things) devices.

Big Data Reporting System: Four sources of business intelligence

- **Prescriptive analytics:** tells user what actions *should* be taken in response to specific questions. Prescriptive analytics helps them determine which campaigns to run and for which products. Another use is to support product assortment optimization. Business managers can thus determine the optimal configuration of premium, high-end, medium-price, and low-price items that maximize the total value to the company. The analysis draws upon structured data such as the price of items and their baseline demand as well as unstructured data such as substitution effects
- **Predictive analytics:** encompasses a variety of statistical techniques that draw upon current and past data to calculate the statistical likelihood of future scenarios occurring. In business, predictive models are used to analyze current and historical data on potential customers to rank order them in terms of their likely future performance such as their creditworthiness (the likelihood that they will pay their bill) and their likelihood to respond to a particular offer or product promotion.
- **Descriptive analytics:** a mathematical process that describes real-world events and the relationships between factors responsible for them. This form of analysis is useful in allowing management to learn from data about historic activities and events, and understand how they might influence future outcomes. In this context, "historic" data refers to data generated at any point of time when an event occurred, which could be years or only seconds past
- **Diagnostic analytics:** techniques view past performance to determine why something happened the way it did. These tools help managers understand system-wide "pipeline" problems and show them how the various

teams in the system are performing. Often management cannot see the "problem." Instead, they see a symptom of the problem

Big Data Analytics Risks & Control: big data need to be controlled to mitigate risks from misappropriation, theft, and corruption.

- **Data Security:**
  - ***KNOW** **Firewalls:** A central component in controlling against external hackers is the implementation of an electronic firewall that insulates the organization's internal network and stored data from outside intruders on the Internet. A firewall enforces access control to ensure that only authorized traffic passes between the organization and individuals on the outside. Validated users are directed to the application or data they need. Those who fail the validation tests are rejected, and such failed attempts should be logged and investigated by an internal security group.
  - **Access Privileges:** Sometimes individuals are mistakenly granted excessive access privileges to internal networks and data. To counter this, organizations should implement formal procedures for assigning access privileges and should periodically review existing employee privileges.
  - **Password Control:** Most organizations employ a reusable password system. If a password can be guessed or otherwise observed by a computer criminal, he or she can use it to access the system. The best password control rests heavily on common sense and procedures to enforce it. Passwords should be changed periodically.
  - **System Audit Trails:** System audit trails are logs that record activity at the system, application, and user level. They have many uses, but as a security device, they can monitor user activity at the lowest level of detail. An audit log can also capture detailed data at the keystroke level.
  - **Outsourcing Controls:** Big data outsourcing activities are not riskless endeavors; client organizations hand over their data to third-party service providers who then perform the analysis or, in turn, outsource the data to subservice provider.
    - Risk for failure to perform - the service provider does not deliver at all or provides unreliable results upon which the client organization relies. external auditors of the service providers and subservice providers may issue a Statement on Standards for Attestation Engagements No. 16 (SSAE 16) report to the auditors of the client company. SSAE 16 is the definitive standard by which the client firm's auditors can determine whether the controls at the third-party service provider are free from material weaknesses

MANAGEMENT REPORTING SYSTEM (MRS): management reporting has long been recognized as a critical element of an organization's internal control structure. An MRS that directs management's attention to problems on a timely basis promotes effective management and thus supports the organization's business objectives.

UNIT 4: (Competency Weight 20%)
Technologies in accounting information – Complete the following activities:

€ Read/Listen to all the module content.

€ As you go through the module content take detailed notes for each learning objective below. You can copy and paste directly from Cengage/MindTap into Microsoft word.

€ There are currently no recorded cohorts for this unit.

Competency: The graduate explains the roles of database management, enterprise resource planning, and electronic commerce systems in business planning and activities.

In Unit 4, you will learn about advanced technologies that are important to accounting information systems. These technologies include database management systems (DBMS), enterprise resource planning (ERP) systems, and electronic commerce systems (ECS). In addition, you will learn about how these advanced technologies are utilized within the accountant's role.

D217 – Accounting Information Systems
Updated Study Guide Notes

Module 7: You should be able to answer the following questions after studying this module: The student explains how database management systems are used to manage an organization's data resources.

Describe the operational problems inherent in the flat-file approach to data management that led to the database concept. ***KNOW***

\ Many so-called legacy systems are characterized by the flat-file approach to data management. In this environment, users own their data files. Exclusive ownership of data is a natural consequence of two problems associated with the legacy-system era. The first problem is a business culture that erects barriers between organizational units that inhibit entity-wide integration of data. The second problem stems from limitations in flat-file management technology, which require data files to be structured to the unique needs of the primary user. Thus, the same data, used in slightly different ways by different users, may need to be restructured and reproduced in physically different file

Data Redundancy: the cause of three types of data management problems:

- **data storage:** an efficient information system captures & stores data only once & makes this single source available to all users who needs it. This is not possible for flat file environment as data is stored and collected multiple times.
- **data updating:** When users maintain separate files, any such change must be made separately for each user. This adds significantly to the cost of data management.
- **Currency of information**. In contrast to the problem of performing multiple updates is the problem of failing to update the files of all users affected by a change. If update messages are not properly disseminated, then some users may not record the change and will perform their duties and make decisions based on outdated data.
- **(not part of the 3 but a risk) Task Data Dependency:** Another problem with the flat-file approach is the user's inability to obtain additional information as his or her needs change. This problem is called task-data dependency. The user's information set is constrained by the data that he or she possesses and controls.

Flat File problem solved: by data sharing – **database approach**

- *No data redundancy.* Each data element is stored only once, thereby eliminating data redundancy and reducing storage costs.
- *Single update.* Because each data element exists only in one place, it requires only a single update procedure. This reduces the time and cost of keeping the database current.
- *Current values.* A change any user makes to the database yields current data values for all other users. For example, when User 1 records a customer address change, User 3 has immediate access to this current information.
- *Task-data independence.* Users have access to the full domain of data available to the firm. As users' information needs expand beyond their immediate domain, the new needs can be more easily satisfied than under the flat-file approach. Only the limitations of the data available to the firm (the entire database), and the legitimacy of their need to access it, constrain users.

Three Conceptual Models: Most commonly used are hierarchical model (also termed *navigational modes or internal view)*, users & relational model. Hierarchical still exist in legacy systems. Most modern systems use relational model/database.

Summarize the relationships between the defining elements of the database environment. ***KNOW***

ELEMENTS OF DATABASE ENVIRONMENT: Users, DBMS(database management system), database administrator & physical database.

1. **Users:** Users access database in 2 ways -
    - user application programs that sends data access requests to DBMS which validates the requests & retrieves the data for processing.

- Direct query – no formal user programs. DBMS has a bilt in query facility that allows authorized users to process data independent of professional programmers.

2. ***KNOW** **Database Management System:** (DBMS) provides controlled access to database. It is the 2nd element of the database approach. It is a control between users programs and physical database. DBMS is a special software system that is programmed to know which data elements each user is authorized to access. Some features of DBMS:
   - **Program development** – contains application development software. Users & programmers can use this to create application access to database
   - **Back up & recovery** – periodically makes back up copies of the physical database
   - **Database usage reporting** – captures statistics on what, when and who are using the data. Database administrator uses this info to assign user authorization & maintain database.

   - ***KNOW** **Database Access –** permit authorized users to access database. 3 modules facilitate these tasks:

     - *Data Definition Language (DDL)*: a programming language used to define the physical database to DBMS. Defines database on 3 levels/views:
       i. Internal View: physical arrangement of records in the database. Lowest level of representation. Internal view describes the structure of records, links & physical arrangement, & sequence of files. There's only 1 internal view of the database.
       ii. Conceptual View (Schema): represents the database logically and abstract. Allows users to call for data without knowing or needing too specific data. Only 1 conceptual view for a database.
       iii. User view (subschema): *User View* defines how particular user sees the portion on database that he or she Is authorized to access. Database is only limited to their authorization.

       DBMS Operation (summary):
       1. User calls for data to dbms. Data is in special manipulation language.
       2. DBMS analyzes the requests & authorization (denied if data doesn't match).
       3. DBMS determines data structure parameters from internal view & passes thru operating system.
       4. OS interacts with disk storage device to retrieve data from physical database.
       5. OS stores data in main memory buffer area managed by DBMS.
       6. DMBS transfers data to user's work location.
       7. When processing is complete, #4,5,6 are reversed to restore data processed.

     - *Data Manipulation Language (DML):* proprietary programming language used to retrieve, process, & store data. Entire user programs may be written in the DML, or alternatively, selected DML commands can be inserted into programs that are written in universal languages, such as PL/1, COBOL, and FORTRAN. Inserting DML commands enables legacy application programs, which were originally written for the flat-file environment or earlier types of DBMSs, to be easily converted to work in the current database environment. By replacing the old DML commands with the new commands, user programs can be modified to function in the new environment.
     - *Query Language:* The query capability of the DBMS permits end users and professional programmers to access data in the database directly without the need for conventional programs. SQL emerged as standard query language for both mainframe & microcomputer DBMSs. SQL is a fourth gen, non procedural language with many commands that allow users to input, retrieve, and modify data easily. Many database query systems require no SQL knowledge. Users select data visually byb pointing & clicking the desired attributes. By reducing reliance on professional programmers, managers are better able to deal with problems that arise.

3. ***KNOW** **Database Administrator (DBA):** Third element - position doesn't exist in flat-file environment. DBA is responsible for managing the database resource. Having multiple users share a common database

requires organization, coordination, rules, and guidelines to protect the integrity of the database. Another important function of the DBA is the creation and maintenance of the data dictionary. The data dictionary describes every data element in the database. This enables all users (and programmers) to share a common view of the data resource and greatly facilitates the analysis of user needs.

Organizational Interactions of DBA: *Interactions involves - Management, End users, System Professionals, Operations* * relationship among DBA, end users, and system professionals of organizations.

By keeping access authority separate from systems development (application programming), the organization is better able to control and protect the database. Intentional and unintentional attempts at unauthorized access are more likely to be discovered when these two groups work independently.

e 9-1 Functions of the Database Administrator

Database Planning	Implementation
Develop organization's database strategy	Determine access policy
Define database environment	Implement security controls
Define data requirements	Specify test procedures
Develop data dictionary	Establish programming standards
Design	**Operation and Maintenance**
Logical database (schema)	Evaluate database performance
External users' views (subschemas)	Reorganize database as user needs demand
Internal view of database	Review standards and procedures
Database controls	
	Change and Growth
	Plan for change and growth
	Evaluate new technology

4. **Physical Database:** Fourth element. Lowest level of the database. Consists of magnetic spots on magnetic disks. Other levels of database (user view, conceptual view, internal view) are abstract representation of physical level. Database is a collection of records & files.
    - *Relational database* are based on *indexed sequential file structure*. Facilitates both direct access to individual records & batch processing of entire file. Multiple indexes can be used to create a cross reference called *inverted list.*

DATA MODELING CONCEPTS*: (*NOT TESTED)*

Data model is a visual representation of an organization's data (blueprint). Model represents the nature of data & business rules that dictate how they're used.

- *Top-Down Approach:* requires a detailed analysis of organization's information needs
- *Bottom – Up approach:* Client organization's database developers may modify the model to suit the company's specific needs
- *Entity* - Resource, event, or agent. anything about which the organization wishes to capture data. Named in singular noun form (ie. Customer vs Customers).
- *Entity Relationship (ER) diagram* - The graphical technique to identify entities and relationships
- *Entity-level ER diagram* - This is a high-level perspective of the overall schema, which presents only the key entities and their relationships and it does not show the data types and keys contained within the entities.

- *Occurrence:* Used to describe the number of instances or records that pertain to a specific entity.
- *Attributes:* the data elements that define an entity. Equivalents to adjectives in the English language that serve to describe the objects.
- *Association:* describes the nature of the functional connection between two entities in a relation. Relationship among record types (ie. *Ships, requests, receives)*
- *Cardinality: t*he degree of association between two entities. cardinality describes the number of possible occurrences in one table that is associated with a single occurrence in a related table. Four basic forms of cardinality are possible: zero or one (0,1), one and only one (1,1), zero or many (0,M), and one or many (1,M).

Describe the anomalies caused by unnormalized databases and the need for data normalization.

******KNOW*** **DATABASE ANOMALIES:**

Anomalies: Negative operational symptoms caused by improperly normalized tables. Improperly normalized tables can cause DBMS processing problems that restrict, or even deny, users' access to the information they need. Specifically, these are the update anomaly, the insertion anomaly, and the deletion anomaly. One or more of these anomalies will exist in tables that are not normalized or are normalized at a low level, such as the **first normal form (1NF)** and **second normal form (2NF)**. To be free of anomalies, tables must be normalized to the **third normal form (3NF)** level.

- **Update Anomaly:** Unintentional updating of data in a table, resulting from data redundancy. result of data redundancy in an unnormalized table
- **Insertion Anomaly:** Unintentional insertion of data into a table.
- **Deletion Anomaly:** Unintentional deletion of data from a table. may go undetected, leaving the user unaware of the loss of important data until it is too late

Normalizing tables in a Relational Database: anomalies above are dependencies (symptoms of structural problems within tables). These are known as:

- ***repeating groups:*** It occurs when multiple values for a particular attribute exist in a specific tuple.
- ***partial dependencies****:* Occurs when one or more nonkey attributes are dependent on (defined by) only part of the primary key rather than the whole key.
- ***transitive dependencies:*** occurs in a table where nonkey attributes are dependent on another nonkey attribute and independent of the table's primary key.

The normalization process involves identifying and removing structural dependencies from the table(s) being modeled such that the resulting 3NF table designs will meet two conditions:

1. All nonkey (data) attributes in the table are dependent on (defined by) the primary key.
2. All nonkey attributes are independent of the other nonkey attributes.

In other words, a 3NF table is one in which the primary key of a table wholly and uniquely defines each attribute in the table. Furthermore, none of the table attributes is defined by an attribute other than the primary key.

Module 8: You should be able to answer the following questions after studying this module:
The student describes the role of an enterprise resource planning system in the integration of business functions.

Describe the general functionality and key elements of enterprise resource planning (ERP) systems.

******KNOW*** **enterprise resource planning (ERP)** : generalized systems that incorporate the best business practices in use. Organizations mix and match precoded software components to assemble an ERP system that best meets their

business requirements. ERP systems are multiple module software packages that evolved primarily from traditional manufacturing resource planning (MRP II) systems.

objective of ERP: integrate key processes of the organization, such as order entry, manufacturing, procurement and accounts payable, payroll, and human resources So a single computer system can serve each unique needs of functional areas.

ERP functionality falls into two general groups of applications:

- **core applications aka Online Transaction Processing (OLTP):** Applications that operationally support the day-to-day activities of the business. Core applications include, but are not limited to, sales and distribution, business planning, production planning, shop floor control, and logistics.
  - **OLTP:** Events consisting of large numbers of relatively simple transactions such as updating accounting records that are stored in several related tables. Includes decision support, modeling, information retrieval, ad hoc reporting/analysis, and what-if analysis
- **business analysis applications – *no description in book***

ENTERPRISE RESOURCE PLANNING (ERP): Organizations mix and match precoded software components to assemble ERP system that best meets their business needs. Multiple module software packages that evolved primarily from traditional manufacturing resource planning (MRP II) systems.

2 General groups of applications:

- **Core Applications**
- **Online transaction Processing.**

Recognize the purpose of data warehousing as a strategic tool.

Data warehouse: a relational or multidimensional database that may consume hundreds of gigabytes or even terabytes of disk storage. It is a database constructed for quick searching, retrieval, ad hoc queries, and ease of use. The data are normally extracted periodically from an operational database or from a public information service.
Data Mart: When the data warehouse is organized for a single department or function
*Note: R*ather than containing hundreds of gigabytes of data for the entire enterprise, a data mart may have only tens of gigabytes of data. Other than size, we make no distinction between a data mart and a data warehouse.

The data warehousing process has the following essential stages:

- Modeling data for the data warehouse
- Extracting data from operational databases
- Cleansing extracted data
- Transforming data into the warehouse model
- Loading data into the data warehouse database

Most organizations implement a data warehouse as part of a strategic IT initiative that involves an ERP system

Module 9: You should be able to answer the following questions after studying this module: The student explains the importance of security to electronic commerce systems.

Describe the topologies that are employed to achieve connectivity across the internet.

- Local area networks (LANs)
- wide area networks (WANs)
- EDI are electronic commerce technologies

D217 – Accounting Information Systems
Updated Study Guide Notes

Identify issues of security, assurance, and trust pertaining to electronic commerce.

KNOW** **Encryption:** Encryption is the conversion of data into a secret code for storage in databases and transmission over networks. The sender uses an encryption algorithm to convert the original message (called ***cleartext) into a coded equivalent (called ***ciphertext***). At the receiving end, the ciphertext is decoded (decrypted) back into cleartext.

- **Caeser cipher:** Named after Julius Caeser. Earliest encryption method. Consists of 2 components:
  - **Key:** mathematical value for the purpose of encrypting/decoding a data
  - **Algorithm:** procedure of shifting each letter in the cleartext message by number of positions that the key value indicates
- ****KNOW** Nothing less than 128-bit algorithms are considered truly secure.
- 2 commonly used methods are private key & public key
  - ***private key*** (both sender & receiver use the same encryption key) and ***symmetric key (***Single key used in an encryption algorithm to both code and decode a message.)
  - **public key encryption:** Technique that uses two encryption keys: one for encoding the message, the other for decoding it.
    - **digital envelope:** Encryption method in which both DES and RSA are used together.

Digital Authentication:

- **digital signature:** Electronic authentication technique that ensures the transmitted message originated with the authorized sender and that it was not tampered with after the signature was applied.
- **Digital certificate:** sender's public key that has been digitally signed by trusted third parties. It's like an electronic identification card that is used in conjunction with a public key encryption system to verify the authenticity of the message sender.
- **certification authorities (CAs):** A trusted third party that issues a digital certificate.
- **Public key infrastructure (PKI)** constitutes the policies and procedures for administering this activity. A PKI system consists of:
  (1) A certification authority that issues and revokes digital certificates.
  (2) A registration authority that verifies the identity of certificate applicants. The process varies depending on the level of certification desired. It involves establishing one's identity with formal documents, such as a driver's license, notarization, fingerprints, and proving one's ownership of the public key.
  (3) A certification repository, which is a publicly accessible database that contains current information about current certificates and a certification revocation list of certificates that have been revoked and the reasons for revocation.

***KNOW** **Firewalls:** Software and hardware that provide a focal point for security by channeling all network connections through a control gateway. A system used to insulate an organization's intranet from the Internet. Firewalls can also be used to protect LANs from unauthorized internal access.

- Network-level Firewall: provides basic screening of low security messages & routes them to their destinations based on the source & destination attached.
- Application-level Firewall: provides high level network security. These firewalls are configured to run security applications called proxies that perform sophisticated functions, such as verifying user authentication.

***KNOW** **Seals of Assurance**: To legitimately bear the seal, the company must show that it complies with certain business practices, capabilities, and controls. Six seal-granting organizations: Better Business Bureau (BBB), TRUSTe, Verisign, Inc., International Computer Security Association (ICSA), AICPA/CICA WebTrust, and AICPA/CICA SysTrust.

D217 – Accounting Information Systems
Updated Study Guide Notes

Recognize the electronic commerce implications for the accounting profession. ****KNOW***

(Didn't get Safe Harbor question in OA)

Privacy Violation: Privacy pertains to the level of confidentiality that an organization employs in managing customer and trading partner data. Privacy applies also to data that websites collect from visitors who are not customers.

- **Safe Harbor Agreement:** implemented in 1995 addresses the importance of privacy. The two-way agreement between the United States and the European Union establishes standards for information transmittal. Compliance requires companies to meet 6 conditions:
  - Notice
  - Choice
  - Onward Transfer
  - Security & Data Integrity
  - Access
  - Enforcement

Continuous Auditing: Auditors use *intelligent control agents* (computer programs) that embody auditor-defined heuristics that search electronic transactions for anomalies. Upon finding unusual events, the control agent will first search for similar events to identify a pattern. If the anomaly cannot be explained, the agent alerts the auditor with an alarm or exception report.

Electronic Audit Trails: Validating EDI transactions may involve the client, its trading partners, and the VAN that connects them. This could take the form of direct review of these systems or collaboration between the auditors of the trading partners and VANs.
value-added network (VAN): *Hosted service offering that acts as an intermediary between business partners sharing standards-based or proprietary data via shared business processes.*

Confidentiality of Data: Accountants need to understand the cryptographic techniques used to protect the confidentiality of stored and transmitted data. They need to assess the quality of encryption tools used and the effectiveness of key management procedures that CAs use.

Authentication: With no physical forms to review and approve, authentication is accomplished through digital signatures and digital certificates. To perform their assurance function, accountants must develop the skill set needed to understand these technologies and their application.

Nonrepudiation: Accountants are responsible for assessing the accuracy, completeness, and validity of transactions that constitute client sales, accounts receivable, purchases, and liabilities. As with the problem of authentication, electronic commerce systems can also use digital signatures and digital certificates to promote nonrepudiation.

Data Integrity: To assess data integrity, accountants must become familiar with the concept of computing a digest of a document and the role of digital signatures in data transmissions.
Access Controls: Accounting firms need to be expert in assessing their clients' access controls. Many firms are now performing penetration tests designed to assess the adequacy of their clients' access control by imitating known techniques that hackers and crackers use.

Changing Legal Environment: To estimate a client's exposure to legal liability in this setting, the public accountant must understand the potential legal implications (both domestic and international) of transactions that the client's electronic commerce system processes.

D217 – Accounting Information Systems
Updated Study Guide Notes

UNIT 5: (Competency Weight 20%)
Systems development activities – Complete the following activities:

- € Read/Listen to all the module content.
- € As you go through the module content take detailed notes for each learning objective below. You can copy and paste directly from Cengage/MindTap into Microsoft word.
- € There are currently no recorded cohorts for this unit.

In Unit 5, you will learn about the accountant's role in the system development life cycle (SDLC) by which organizations design, acquire, and implement their information systems. The accountant's role includes specifying the documentation requirements and the internal control requirements. The accountant's role also includes their technical expertise regarding the accounting procedures and rules that should be incorporated into the information system.

Competency: The graduate describes the importance of the accountant's role in systems and software development activities.

Module 10: You should be able to answer the following questions after studying this module: The student describes the accountant's role in system and software development and acquisition to support business activities.

Describe the accountant's role in systems development. ***KNOW***

Accountant's Concerns:
(1) The creation of an entity-wide information system involves significant financial transactions.
(2) the computer systems that emerge from the systems development process. The quality of accounting information presented in an organization's financial statements is directly related to the quality of the accounting information systems that process and report it.
Systems development processes that are formal and well controlled are more likely to produce AIS applications that are free from internal control weaknesses than those that are informal and poorly controlled. Stronger application controls translates into lower financial reporting risk.

Participants in Systems Development: Classified into three broad groups:
- **Systems professionals** are systems analysts, systems engineers, database designers, and programmers. These individuals actually build the system. They gather facts about problems with the current system, analyze these facts, and formulate a solution to solve the problems. The product of their efforts is a *new information system.*
- **End users** are those for whom the system is built. There are many users at all levels in an organization. These include managers, operations personnel from various functional areas including accountants.
- **Stakeholders** are individuals who have an interest in the system but are not formal end users. These include the internal steering committee that oversees systems development, internal auditors including IT auditors, and external auditors acting as consultants or serving in the role of internal auditor. Stakeholders work with the development team to ensure that users' needs are met, that adequate internal controls are designed into the information systems under construction, and that the systems development process itself is properly implemented and controlled.

Identify the approaches to system acquisition. ***KNOW***

Organizations acquire information systems in two ways:
(1) they develop customized systems in-house through formal systems development activities and
(2) they purchase commercial systems from software vendors.

D217 – Accounting Information Systems
Updated Study Guide Notes

Commercial Systems: Four factors have contributed to the growth of commercial software market:
(1) the relatively low cost of general commercial software as compared to customized software;
(2) the emergence of industry-specific vendors who target their software to the needs of particular types of businesses;
(3) a growing demand from businesses that are too small to afford in-house systems' development staff
(4) the trend toward downsizing organizational units and the move toward distributed data processing has made the commercial software option appealing to larger organizations.

commercial software packages are divided into three basic groups: turnkey systems, backbone systems, and vendor-supported systems.

- **Turnkey Systems:** completely finished & tested systems that are ready for implementation. Often general – purpose systems or systems customized to specific industry. Examples of turnkey systems:
  - General Accounting Systems: designed to serve a wide variety of user needs.
  - Special Purpose Systems: Some software vendors create special-purpose systems that target selected segments of the economy. (Ie. medical field)
  - Office Automation Systems: They are computer systems that improve the productivity of office workers. (Ie. DBS, spreadsheet programs, publishing, etc)
- **Backbone Systems:** Basic system structure on which to build. Comes with all primary processing modules programmed (ie. ERP)
- **Vendor Supported Systems.** systems that the vendor develops and maintains for the client organization. Software as a Service (SaaS), Infrastructure as a Service (IaaS), and Platform as a Service (PaaS), which are offered by cloud-based service providers, are examples of this class of commercial software.

In-House vs. Commercial Software Issues:

***Implementation time*:** longer for custom in-house systems to develop & implement. Commercial can be implemented quickly once need is recognized.
Cost: Inhouse development cost absorbed by single user. Commercial software is spread across many users is cost is reduced to a fraction
Reliability: Commercial software are thoroughly tested before release so less likely to contain logic errors
Independence: Purchasing a vendor-supported system creates a dependency on the vendor for maintenance. The client firm runs the risk that the vendor will cease to support the system or even go out of business.
Need for Customized Systems: Advantage of inhouse is ability to produce application to exact specification. This is a disadvantage of commercial software.
Maintenance: In-house development provides users with proprietary applications that can be effectively maintained. When user needs change, modifying commercial software to accommodate the changes may be difficult or even impossible.

Identify the approaches to software development: ****KNOW*** Accountants play significant role in SDLC Activities

- **Provide Technical Expertise:** Detailed design phase involves precise specifications of procedures, rules, and conventions to be used in the system. In the case of an AIS, these specifications must comply with GAAP, GAAS, SEC regulations, and IRS codes. Failure to so comply can lead to legal exposure for the firm.
- **Specify Documentation Standards:** In the implementation phase, the accountant plays a role in specifying system documentation.

  Verify Control Adequacy
  The applications that emerge from the SDLC must possess controls that are in accordance with the provisions of Statement on Auditing Standards No. 109. This requires the accountant's involvement at both the detailed design and implementation phases.

D217 – Accounting Information Systems
Updated Study Guide Notes

UNIT 6: (Competency Weight 20%)
Computer controls and IT auditing – Complete the following activities:

- € Read/Listen to all the module content.
- € As you go through the module content take detailed notes for each learning objective below. You can copy and paste directly from Cengage/MindTap into Microsoft word.
- € Watch the cohort recording for Unit 6: Accounting Information Systems - Computer Controls and IT Auditing. The videos are not all inclusive and are meant to supplement (not replace) the readings.

In Unit 6, you will learn about the ethical issues in business as they relate specifically to computer systems. These computer systems include the internal control structure and the control activities specified in the Committee of Sponsoring Organization (COSO) framework. You will also learn about the auditing of key IT controls critical to an audit, including security and access, IT governance, systems development, program changes, and application auditing using software packages.

Competency: The graduate explains computer controls and IT auditing procedures essential to information and financial reporting integrity.

Module 11: You should be able to answer the following questions after studying this module: The student explains ethical issues and internal controls important to accountants and management to comply with the (SOX).

o Explain the ethical issues related to the use of information technology. **** 1 question about ethics**

Business ethics: Pertains to the principles of conduct that individuals use in making choices and guiding their behavior in situations that involve the concepts of right and wrong.

Ethical Issues in Business

Equity	Executive salaries
	Comparable worth
	Product pricing
Rights	Corporate due process
	Employee health screening
	Employee privacy
	Sexual harassment
	Diversity
	Equal employment opportunity
	Whistle-blowing
Honesty	Employee and management conflicts of interest
	Security of organization data and records
	Misleading advertising
	Questionable business practices in foreign countries
	Accurate reporting of shareholder interests
Exercise of Corporate Power	Political action committees
	Workplace Safety
	Product safety
	Environmental issues
	Divestment of interests
	Corporate political contributions
	Downsizing and plant closures

Ethical Decision Making:

D217 – Accounting Information Systems
Updated Study Guide Notes

Ethical Responsibility: Responsibility of organization managers to seek a balance between the risks and benefits to their constituents that result from their decisions.

- **Proportionality:** The benefit from a decision must outweigh the risks. Furthermore, there must be no alternative decision that provides the same or greater benefit with less risk.

Justice. The benefits of the decision should be distributed fairly to those who share the risks. Those who do not benefit should not carry the burden of risk.

Minimize risk. Even if judged acceptable by the principles, the decision should be implemented so as to minimize all of the risks and avoid any unnecessary risks.

Computer Ethics: Analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology. Includes details about software as well as hardware and concerns about networks connecting computers as well as computers themselves.

3 levels of computer ethics:

- **Pop**: the exposure to stories & reports found in popular media regarding good or bad ramification of computer technology. Society at large needs to be aware of such things as computer viruses and computer systems designed to aid handicapped persons.
- **Para:** taking a real interest in computer ethics cases and acquiring some level of skill and knowledge in the field. All systems professionals need to reach this level of competency so they can do their jobs effectively.
- **Theoretical:** interest to multidisciplinary researchers who apply the theories of philosophy, sociology, and psychology to computer science with the goal of bringing some new understanding to the field.

CONCERNS WITH COMPUTERS: Privacy, Security (accuracy & confidentiality), Ownership of Property (intellectual property – software), Equity in Access, Environmental Issues, Artificial Intelligence, Unemployment & Displacement, and misuse of computers.*** read textbook

****KNOW* SABARNES-OXLEY ACT & ETHICAL ISSUES:** American Competitiveness & Corporate Accountability Act of 2002. Sox most significant securities law since the Securities and Exchange Commission (SEC) Acts of 1933 and 1934.

Section 406 – Code of Ethics for Senior Financial Officers: requires public companies to disclose to the SEC whether they have adopted a code of ethics that applies to the organization's chief executive officer (CEO), CFO, controller, or persons performing similar functions. If the company has not adopted such a code, it must explain why. A public company may disclose its code of ethics in several ways:

(1) by including the code as an exhibit to its annual report,
(2) by posting the code to the company website, or
(3) by agreeing to provide copies of the code upon request.

The SEC has ruled that compliance with Section 406 necessitates a written code of ethics that addresses the following ethical issues: Conflicts of Interests, Full & Fair Disclosures, Legal Compliance , Internal Reporting Code of Violations, Accountability.

Identify the key features of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) internal control framework. ****KNOW*

D217 – Accounting Information Systems
Updated Study Guide Notes

INTERNAL CONTROL CONCEPTS & TECHNIQUES:

internal control system comprises policies, practices, and procedures employed by the organization to achieve four broad objectives:

1. To safeguard assets of the firm.
2. To ensure the accuracy and reliability of accounting records and information.
3. To promote efficiency in the firm's operations.
4. To measure compliance with management's prescribed policies and procedures.

4 Modifying Assumptions that guide designers & auditors of internal controls:

- **Management Responsibility:** Concept under which the responsibility for the establishment and maintenance of a system of internal control falls to management.
- **Reasonable Assurances:** Assurance provided by the internal control system that the four broad objectives of internal control are met in a cost-effective manner.
- **Methods of Data Processing:** Internal controls should achieve the four broad objectives regardless of the data processing method used.
- **Limitations:** Every system of internal control has limitations on its effectiveness
  (1) the possibility of error—no system is perfect,
  (2) circumvention—personnel may circumvent the system through collusion or other means,
  (3) management override—management is in a position to override control procedures by personally distorting transactions or by directing a subordinate to do so, and
  (4) changing conditions—conditions may change over time and render existing controls ineffective.

Control Weaknesses & Risks: Simply stated the purpose of internal control is to mitigate risk. Control Weaknesses increases the firm's risk to financial loss or injury from the threats. Internal Control shield is composed of 3 layers of control **(PDC Internal Control Model)**:

- **Preventative:** First Line of Defense. Passive techniques designed to reduce the frequency of occurrence of undesirable events. Preventing errors and fraud is far more cost-effective than detecting and correcting problems after they occur.
- **Detective:** Second Line of Defense. Devices, techniques, and procedures designed to identify and expose undesirable events that elude preventive controls. . Detective controls reveal specific types of errors by comparing actual occurrences to preestablished standards. When the detective control identifies a departure from standard, it sounds an alarm to focus attention on the problem
- **Corrective:** Actions taken to reverse the effects of errors detected. Detective controls identify anomalies and draw attention to them; corrective controls actually fix the problem.

The PDC control model is conceptually complete but offers little practical guidance for designing specific controls. For this, we need a more precise framework. The current authoritative document for specifying internal control objectives and techniques is **Statement on Auditing Standards (SAS) No. 109**, which is based on the COSO framework.

Section 404 requires the management of public companies to assess the effectiveness of the organization's internal controls. This entails providing an annual report addressing the following points:

(1) a statement of management's responsibility for establishing and maintaining adequate internal control,
(2) an assessment of the effectiveness of the company's internal controls over financial reporting,
(3) a statement that the organization's external auditors have issued an attestation report on management's assessment of the company's internal controls,
(4) an explicit written conclusion as to the effectiveness of internal control over financial reporting, and
(5) a statement identifying the framework used in the assessment of internal controls.

D217 – Accounting Information Systems
Updated Study Guide Notes

o Describe the objectives and application of both physical and IT control activities ***KNOW

The COSO framework consists of five components:

1. the control environment: Foundation for the other four control components. The control environment sets the tone for the organization and influences the control awareness of its management and employees

2. risk assessment: Identification, analysis, and management of risks relevant to financial reporting.

3. information and communication: The accounting information system consists of the records and methods used to initiate, identify, analyze, classify, and record the organization's transactions and to account for the related assets and liabilities. The quality of information the accounting information system generates impacts management's ability to take actions and make decisions in connection with the organization's operations and to prepare reliable financial statements

4. monitoring: Process by which the quality of internal control design and operation can be assessed.

5. Control activities: Policies and procedures to ensure that appropriate actions are taken to deal with the organization's risks.

- ***o IT Controls:*** *Relate specifically to computer environment.*
  - o *General Controls – Controls that pertain to entity-wide concerns such as controls over the data center, organization databases, systems development, and program maintenance.*
  - o *Application Controls: Controls that ensure the integrity of specific systems. (ie. Sales orders, processing, a/p, payroll.* ***3 application control categories:***
    - o ***input controls:*** *Programmed procedures, often called edits, that perform tests on transaction data to ensure that they are free from errors. Check digit is a Method for detecting data coding errors in which a control digit is added to the code when it is originally designed to allow the integrity of the code to be established during subsequent processing. (transcription & transposition errors). Other controls are missing data check, numeric-alphabetic check, limit check, range check, reasonableness check, validity check*
    - o ***processing controls****: programmed procedures to ensure that an application's logic is functioning properly. Such as batch controls, run-to-run controls, hash total*
      - ❖ *Audit Trail Controls: Ensures that every transaction can be traced through each stage of processing from its economic source to its presentation in financial statements. Such as transaction logs, Log of automatic transactions*
      - ❖ *Master File Backup Controls: procedures may be viewed as either a general control or an application control. In a database environment, the database supports all corporate users, and database backup procedures apply to all applications. Therefore, backup in a databases environment is a* ***general*** *control*
    - ***o output controls:*** *A combination of programmed routines and other procedures to ensure that system output is not lost, misdirected, or corrupted and that privacy is not violated. Controls include output spooling, print programs, computer output waste, report distribution, end user controls.*
- o ***Physical Controls:*** *This class of controls relates to the human activities employed in accounting systems. These activities may be purely manual, such as the physical custody of assets, or they may involve the physical use of computers to record transactions or update accounts. There are 6 Categories of physical controls:*
  - o ***Transaction Authorization:*** *Procedure to ensure that employees process only valid transactions within the scope of their authority.*
  - o ***Segregation of Duties:*** *Separation of employee duties to minimize incompatible functions.*
    1. *Authorization for transactions is separate from processing of transaction.*
    2. *Responsibility for custody of assets should be separate from record-keeping responsibility.*
    3. *Organization should be structured so that a successful fraud requires collusion between two or more individuals with incompatible responsibilities.*

- ***Supervision:*** *Control activity involving the critical oversight of employees.*
- ***Accounting Records:*** *Organizations must maintain audit trails for two reasons. First, this information is needed for conducting day-to-day operations. The audit trail helps employees respond to customer inquiries by showing the current status of transactions in process. Second, the audit trail plays an essential role in the financial audit of the firm. It enables external (and internal) auditors to verify selected transactions by tracing them from the financial statements to the ledger accounts, to the journals, to the source documents, and back to their original source.*
- ***Access Controls:*** *Controls that ensure that only authorized personnel have access to the firm's assets.*
- ***Independent Verification:*** *Independent checks of the accounting system to identify errors and misrepresentations. Through independent verification procedures, management can assess (1) the performance of individuals, (2) the integrity of the transaction processing system, and (3) the correctness of data contained in accounting records*

Module 12: You should be able to answer the following questions after studying this module: The student applies the segregation of IT duties in order to ensure compliance with Sarbanes-Oxley Act (SOX) requirements.

Identify the key requirements for management and auditors under Sections 302 and 404 of the (SOX). ****KNOW***

SECTION 302: requires corporate management, including the chief executive officer (CEO), to certify financial and other information contained in the organization's quarterly and annual reports. The rule also requires corporate management to certify the internal controls over financial reporting. The certifying officers are required to have designed internal controls, or to have caused such controls to be designed, and to provide reasonable assurance as to the reliability of the financial reporting process. Furthermore, they must disclose any material changes in the company's internal controls that have occurred during the most recent fiscal quarter.

SECTION 404: requires the management of public companies to assess the effectiveness of their organization's internal controls over financial reporting. Under this section of the act, management is required to provide an annual report addressing the following points:

1. Describe the flow of transactions, including IT aspects, in sufficient detail to identify points at which a misstatement could arise.
2. Using a risk-based approach, assess both the design and operating effectiveness of selected internal controls related to material accounts.
3. Assess the potential for fraud in the system and evaluate the controls designed to prevent or detect fraud.
4. Evaluate and conclude on the adequacy of controls over the financial statement reporting process.
5. Evaluate entity-wide (general) controls that correspond to COSO internal control framework.

AUDIT IMPLICATIONS: SOX legislation dramatically expands the role of external auditors by mandating that they attest to the quality of internal controls. As part of the attestation responsibility, PCAOB Standard No. 5 specifically requires auditors to understand transaction flows, including the controls pertaining to how transactions are initiated, authorized, recorded, and report

Compliance with *Section 404* requires management to provide the external auditors with documented evidence of functioning controls related to selected material accounts in its report on control effectiveness. The organization's internal audit function, or a specialized SOX group, would likely perform these tests.

Section 302 also carries significant auditor implications. In addition to expressing an opinion on the effectiveness of internal control, auditors have responsibility regarding management's quarterly certifications of internal controls.

Recognize the segregation of duties within a centralized IT function. ****KNOW***

Operational tasks should be separated to:

D217 – Accounting Information Systems
Updated Study Guide Notes

1. Segregate the task of transaction authorization from transaction processing.
2. Segregate record keeping from asset custody.
3. Divide transaction-processing tasks among individuals so that fraud will require collusion between two or more individuals.

superior organizational structure in which the systems development function is separated into two independent groups: new systems development and systems maintenance. The new systems development group is responsible for designing, programming, and implementing new systems projects. Upon successful implementation, responsibility for the system's ongoing maintenance falls to the systems maintenance group. This structure helps resolve the two control problems described previously.

Module 13: You should be able to answer the following questions after studying this module: The student applies mitigants to the operating system to comply with Sarbanes-Oxley Act (SOX).

Describe the principal threats to the operating system. ****KNOW***

The **operating system** is the computer's control program. It allows users and their applications to share and access common computer resources, such as processors, main memory, databases, and printers. If operating system integrity is compromised, controls within individual accounting applications may also be circumvented or neutralized.

Objective:

1. Operating System (OS) translate high level languages (ie. COBOL, C++, BASIC, SQL) into machine-level language that computer can execute. Language translators are called compilers and interpreters.
   a. *Compilers: Language translation modules of the operation system.*
   b. *Interpreters: Language translation modules of the operation system that convert one line of logic at a time.*
2. OS allocates computer resources to user, workgroups, and applications. This includes assigning memory work space (partitions) to applications and authorizing access to terminals, telecommunications links, databases, and printers.
3. OS manages the tasks of job scheduling & multiprogramming. To achieve efficient and effective use of finite computer resources, the OS must schedule job processing according to established priorities and balance the use of resources among the competing applications.

   To perform these tasks consistently and reliably, the operating system must achieve *five fundamental control objectives*.
   1. The operating system must protect itself from users. User applications must not be able to gain control of, or damage in any way, the operating system, thus causing it to cease running or to destroy data.
   2. The operating system must protect users from each other. One user must not be able to access, destroy, or corrupt the data or programs of another user.
   3. The operating system must protect users from themselves. A user's application may consist of several modules stored in separate memory locations, each with its own data. One module must not be allowed to destroy or corrupt another module.
   4. The operating system must be protected from itself. The operating system is also made up of individual modules. No module should be allowed to destroy or corrupt another module.
   5. The operating system must be protected from its environment. In the event of a power failure or other disaster, the operating system should be able to achieve a controlled termination of activities from which it can later recover.

Operating System Securities: Security components in Operating Systems

- **Log On Procedure:** OS's first line of defense against unauthorized access. Verify username/pw
- **Access Token:** if access is successful, OS creates access token *(These contain key information about the user, including user ID, password, user group, and privileges granted to the user.)*

- **Access Control List:** defines access to system resources for valid users
- **Discretionary Access Privileges:** Grants access privileges to other users. (ie. the controller, who is the owner of the general ledger, may grant read-only privileges to a manager in the budgeting department)

Threats to Operating System Integrity

Intentional threats to the operating system are most commonly attempts to illegally access data or violate user privacy for financial gain. However, a growing threat is destructive programs from which there is no apparent gain. These exposures come from three sources:

1. Privileged personnel who abuse their authority. Systems administrators and systems programmers require unlimited access to the operating system to perform maintenance and to recover from system failures. Such individuals may use this authority to access users' programs and data files.
2. Individuals, both internal and external to the organization, who browse the operating system to identify and exploit security flaws.
3. Individuals who intentionally (or accidentally) insert computer viruses or other forms of destructive programs into the operating system.

Describe the principal controls and mitigants to operating system threats ***recommended to read all element in this chapter***

Controls to Operating System & Audit:

- Controlling Access Privileges
- Password Control
- Controlling Malware
- System Audit Trail Controls
- Setting Audit Trail Objectives
- Implementing System Audit Trail

Module 14: You should be able to answer the following questions after studying this module: The student identifies the risks associated with program changes and auditing techniques used to verify application controls.

***** read all of module 14 and know it– seemed like there wasn't enough material to study that's on OA***

Identify the risks and controls associated with program change procedures. ****KNOW***

- **Access tests** verify that individuals, programmed procedures, or messages (e.g., electronic data interchange [EDI] transmissions) attempting to access a system are authentic and valid. Access tests include verifications of user IDs, passwords, valid vendor codes, and authority tables.
- **Validity tests** ensure that the system processes only data values that conform to specified tolerances. Examples include range tests, field tests, limit tests, and reasonableness tests. Validity tests also apply to transaction approvals, such as verifying that credit checks and AP three-way-matches are properly performed by the application.
- **Accuracy tests** ensure that mathematical calculations are accurate and posted to the correct accounts. Examples include recalculations of control totals and reconciliations of transaction postings to subsidiary ledgers.
- **Completeness tests** identify missing data within a single record and entire records missing from a batch. The types of tests performed are field tests, record sequence tests, and recalculation of hash totals and financial control totals.
- **Redundancy tests** determine that an application processes each record only once. Redundancy tests include reviewing record counts and recalculation of hash totals and financial control totals.
- **Audit trail tests** ensure that the application creates an adequate audit trail. Tests include obtaining evidence that the application records all transactions in a transaction log (journal), posts data values to the appropriate accounts, produces complete transaction listings, and generates error files and reports for all exceptions.

D217 – Accounting Information Systems
Updated Study Guide Notes

- Describe the computer-assisted auditing tools and techniques (CAATTs) used to verify the effective functioning of application controls.

black box approach: An approach that does not require the auditor to create test files or to obtain a detailed knowledge of the application's internal logic. Instead, auditors can analyze flowcharts and interview knowledgeable personnel in the client's organization to understand the functional characteristics of the application.

Parallel simulation: Technique that requires the auditor to write a program that simulates key features of processes of the application under review.

generalized audit software (GAS): Software that allows auditors to access electronically coded data files and perform various operations on their contents.