

Chapter 1 - Introduction to Accounting Information Systems

Instructor's Manual

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CHAPTER 1- INTRODUCTION TO ACCOUNTING INFORMATION SYSTEMS

LEARNING OBJECTIVES:

1. An overview of business processes
2. An overview of an accounting information system
3. The business process linkage throughout the supply chain The IT enablement of business processes
4. Basic computer and IT concepts Examples of IT enablement
5. The internal control structure of organizations
6. The importance of accounting information systems to accountants The relation of ethics to accounting information systems

REAL WORLD: FAST FOOD RESTAURANT INDUSTRY

- A recent trend in the fast food restaurant industry is remote order-taking at the drive-through.
- Fast food chains as Hardee's Wendy's, Jack in the Box, and McDonald's have each experimented with remote order-taking at some of their drive-through windows.
- In the case of McDonald's, an experimental order-taking center takes drive-through orders for several different McDonald's locations.
- In addition, some McDonald's locations use off-site order-takers such as stay-at-home moms. Order-taker under both arrangements use voice over Internet protocol, or VoIP technology, a T1 phone line, and instant photographs to process the orders.
- A car pulling up to the menu board trips a magnetic loop that alerts the order-taker, who takes and confirms the order, enters the details on a computer screen, and transmits it instantly to the restaurant.
- In-store employees focus on taking the cash and delivering the food. Using photos of diners allows stores to install multiple drive-through lanes, which can boost car counts.

How does the preceding example relates to accounting information systems?

- An accounting information system must capture, record, and process all financial transactions.
- Prior to the implementation of the experimental drive-through order systems, all in-store and drive-through orders were processed through the cash registers at each local McDonald's.
- When the new, experimental systems were implemented, consider their effects on the system that recorded sales.
- The new technology had to be configured in such a way that
 1. Order details were taken accurately
 2. Those details were forwarded to the correct McDonald's location so that the order could be handed to the customer at the drive-through
 3. The order data had to be included with McDonald's sales and cash received for the day
 4. The correct McDonald's location had to be properly credited with the sale so that the franchise and managers would be given credit for sales they generated

OVERVIEW OF BUSINESS PROCESSES (STUDY OBJECTIVE 1)

The four general types of business processes typical in organizations (which will be described in later chapters of this book) are as follows:

1. Revenue processes (Chapter 8)
 - a. Sales processes
 - b. Sales return processes
 - c. Cash collection processes
2. Expenditure processes (Chapters 9 and 10)
 - a. Purchasing processes
 - b. Purchase return processes
 - c. Cash disbursement processes
 - d. Payroll processes
 - e. Fixed asset processes
3. Conversion processes (Chapter 11)
 - a. Planning processes
 - b. Resource management processes
 - c. Logistics processes
4. Administrative processes (Chapter 12)
 - a. Capital processes
 - b. Investment processes
 - c. General ledger processes

In the example at the beginning of this chapter:

- The remote drive-through processing is part of the revenue processes
- The order-taking combines the sales process and the cash collection process

In addition to revenue processes to sell food to customers and collect the cash, McDonald's must implement some or all of the remaining processes in the preceding list. That is, to sell a Big Mac Extra Value Meal® to a customer.

- McDonald's must first engage in purchase processes to buy meat, vegetables, buns, soft drinks, and other food items, as well as operating supplies
- McDonald's must have payroll processes to pay employees, and fixed asset processes to buy and maintain equipment and other fixed assets
- McDonald's must have conversion processes to convert the raw meat, vegetables, and buns into customer products that can be sold.
- McDonald's must have capital processes that raise funds to buy capital assets, and investment processes to manage and invest any extra cash flow
- McDonald's also needs general ledger processes to ensure that all transactions are recorded into the appropriate general ledger accounts and that financial information is reported to external and internal users

The purpose here of reviewing these processes is not to cover the entire set of details, but to emphasize that there must be prescribed work steps in every area. Employees, work steps, and transaction recording systems must be established in any organization to ensure that business processes occur and that any accounting effects of those processes are captured and recorded.

In addition, organizations implement internal control processes into their work steps to prevent errors and fraud. **Internal controls** are the set of procedures and policies adopted within an organization to safeguard its assets, check the accuracy and reliability of its data, promote operational efficiency, and encourage adherence to prescribed managerial practices.

- For example, McDonald's probably requires that at the end of every day, a manager close each cash register and reconcile the cash in the register to the recorded total sold at that register. This is an internal control process to prevent and detect errors in cash amounts and to discourage employees from stealing cash

OVERVIEW OF AN ACCOUNTING INFORMATION (STUDY OBJECTIVE 2)

Accounting information system comprises the processes, procedures, and systems that capture accounting data from business processes; record the accounting data in the appropriate records; process the detailed accounting data by classifying, summarizing, and consolidating; and report the summarized accounting data to internal and external users.

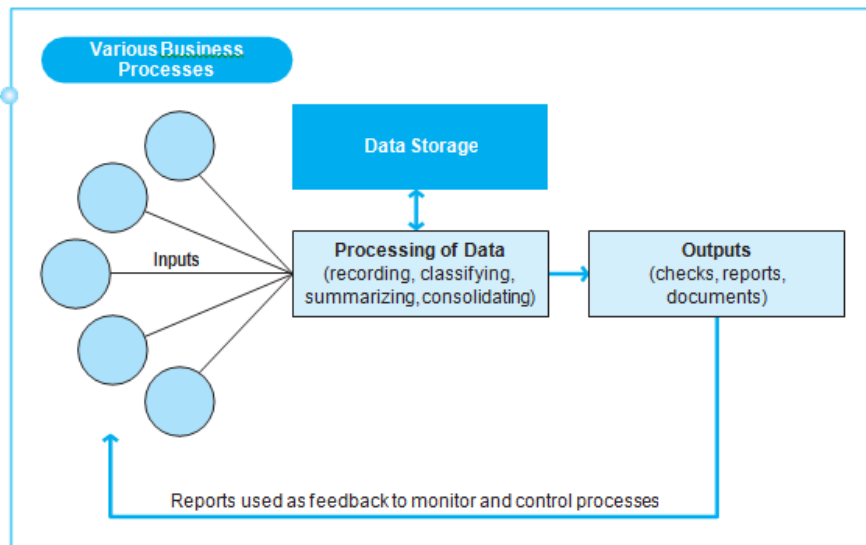
The accounting information system has several components. The following example from McDonalds lists each component of the accounting information system.

1. Work steps within a business process intended to capture accounting data as that business process occurs.
 - When McDonald's employees greet a customer at the cash register, they have several work steps to complete a sale, some of which are accounting related and some of which are not. Greeting the customer with a smile may be an important step, but it has no impact on accounting records. However, using the touch screen at the cash register to conduct the sale does have an accounting effect: sales amounts in the sales records should be increased and cash amounts in cash records should be increased.
2. The manual or computer-based records to record the accounting data from business processes
 - As is true of most companies, McDonald's has a system of computers and computer processes to record the appropriate data from the sale process. These systems usually have a combination of manual and computerized steps. For McDonald's, the manual process is that a person must operate the cash register. The remainder of the McDonald's system is computer-based, and the computer records the sale and all related data.
3. Work steps that are internal controls within the business process to safeguard assets and to ensure accuracy and completeness of the data
 - As mentioned before, the requirement that a manager closes and reconciles the cash register at the end of the day is an example of an internal control within the sales processes.
4. Work steps to process, classify, summarize, and consolidate the raw accounting data
 - For example, sales at each McDonald's franchise must be summarized and consolidated into a single total of sales revenue to be reported on the income statement. At McDonald's, these steps are accomplished by the computer system and the accounting software. In some companies, there may be manual or handwritten accounting records, although currently most organizations use IT systems to conduct some or all of the accounting recording and summarizing processes.

5. Work steps that generate both internal and external reports.
 - McDonald's needs many types of internal reports to monitor the performance of individual franchise locations and regions. In addition, year-end external financial statements such as the income statement, balance sheet, and statement of cash flows must be prepared for external users.

These five components are part of any accounting information system but are likely to be applied differently in different business organizations. Exhibit 1-1 shows an overview of an accounting information system:

Exhibit 1-1
Overview of an Accounting
Information System



- The circles represent the many business processes that occur in the organization—revenue, expenditure, conversion, and administrative processes. As those processes occur, data are captured and become input into the accounting information system
- The accounting information system classifies, summarizes, and consolidates the data. As input and processing occur, data must be stored to or retrieved from data storage. From this stored data and processing, several types of output are prepared. Some of the output would be documents such as purchase orders, invoices, and customer state- ments; other output would be checks to vendors and employees
- The output reports are feedback that managers within the organization use to monitor and control the business processes. The number of computerized versus manual work steps may vary across organizations, but every organization should have each of these component pieces
- In some organizations, the processes may be manual steps per- formed by employees, and the accounting records may be paper journals and ledgers. At the other extreme are companies where many or all of these work steps are performed by computers, and the accounting records are in computer files. In most cases, there is a combination of manual and computerized work steps.

Note: The accounting system internal controls are not pictured in Exhibit 1-1, but there should be internal controls throughout the accounting information system

BUSINESS PROCESS LINKAGE THROUGHOUT THE SUPPLY CHAIN (STUDY OBJECTIVE 3)

Key Terms:

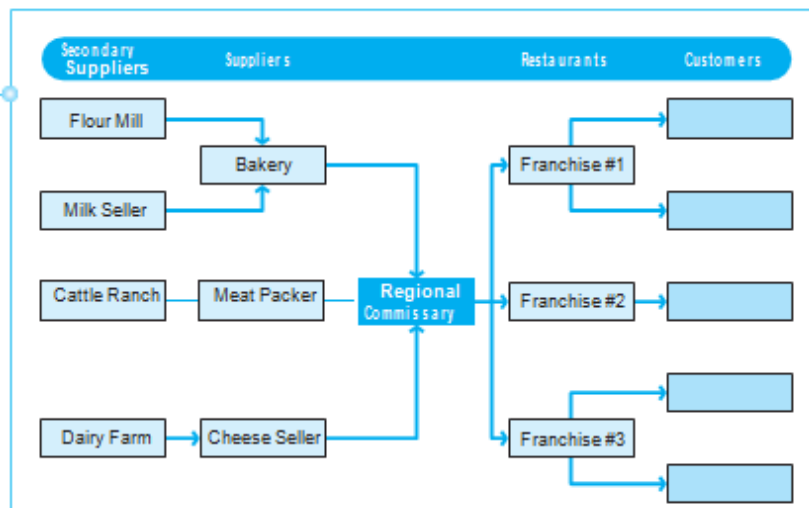
- **Vendor**
 - provides materials or operating supplies to an organization
- **Supply Chain**
 - is the entities, processes, and information flows that involve the movement of materials, funds, and related information through the full logistics process, from the acquisition of raw materials to the delivery of finished products to the end user
- **Supply Chain Management**
 - is the organization and control of all materials, funds, and related information in the logistics process, from the acquisition of raw materials to the delivery of finished products to the end user (customer)
- **IT Enablement**
 - Using IT systems to enhance efficiency and effectiveness of internal or supply chain processes

The accounting information system and the reports generated by the system are intended to help management monitor and control the organization. However, any organization operates in an environment in which it has many interactive relationships with other organizations. For example, McDonald's could not operate without its relationships with the many suppliers that provide the ingredients for its menu selections. There is an entire set of activities (business processes) that culminate when McDonald's sells a Big Mac® to a customer. Consider the road that leads to this culminating sale—it stretches far back into many other organizations.

The following exhibit represents a Simplified Supply Chain for McDonald's:

Exhibit 1-2

A Simplified Supply Chain for McDonald's



The management at McDonald's would find it in the best interest of its company to closely manage, monitor, and control the processes within the supply chain as much as possible. To the extent that McDonald's can influence primary and secondary suppliers to maintain quality of supplies and efficiency of operations, the business processes within McDonald's will operate more smoothly. This connection between the purchasing processes used by McDonald's and the supplier's selling processes represents a supply chain linkage. In order to increase the efficiency and effectiveness of these supply chain linkages, many organizations employ IT systems.

IT ENABLEMENT OF BUSINESS PROCESSES (STUDY OBJECTIVE 4)

Information technology is defined as the computers, ancillary equipment, software, services, and related resources as applied to support business processes. IT usage to support business processes accomplishes one or more of the following objectives:

1. Increased efficiency of business processes
2. Reduced cost of business processes
3. Increased accuracy of the data related to business processes

Any business process has the potential to be improved by IT enablement. In many cases, using IT to enable processes leads to a completely different approach to those processes. Applying IT to business processes is an opportunity to “think outside the box” and consider completely different methods for business processes. This concept of revising processes as IT enabling occurs is called business process reengineering.

Business process reengineering (BPR) is the purposeful and organized changing of business processes to make them more efficient. BPR not only aligns business processes with the IT systems used to record processes, it also improves efficiency and effectiveness of these processes

BASIC COMPUTER AND IT CONCEPTS (STUDY OBJECTIVE 5)

BASIC COMPUTER DATA STRUCTURES

Accounting data are stored in computer files, and an accountant should have some understanding of data structures in IT systems. Data are organized in a data hierarchy in computer systems, as follows:

1. Bit, or binary digit
 - a. Smallest unit of information in a computer system
 - b. Can only have one of two values: zero or one
2. Byte
 - a. Unit of storage represents one character
 - b. One byte is made up of eight bits
3. Field
 - a. One item within a record
4. Record
 - a. Set of related fields for the same entity
5. File
 - a. Entire set of related records
6. Database
 - a. Collection of data stored on the computer in a form that allows data to be easily accessed, retrieved, manipulated, and stored

Other key terms included basic computer structures include:

- **Relational database**
 - Stores data in several small two-dimensional tables that can be joined together in many varying ways to represent many different kinds of relation- ships among the data

- **Master files**
 - are the relatively permanent files that maintain the detailed data for each major process
- **Transaction file**
 - the set of relatively temporary records that will be processed to update the master file.

FILE ACCESS AND PROCESSING MODES

In computer systems, files are organized in one of two ways which determine the type of access provided. **Sequential access** files store records in sequence, with one record stored immediately after another. **Random access** files (sometimes called direct access files) are not written or read in sequential order. The records are stored in random order on a disk media. There are situations where the same files may sometimes be accessed either way, sequentially or randomly. In cases where both access methods are necessary, some systems use the **indexed sequential access method (ISAM)**. ISAM files are stored sequentially, but can also be accessed randomly because an index allows random access to specific records.

Two modes of processing transactions:

1. Batch processing
 - a. Requires that all similar transactions be grouped together for a specified time; then this group of transactions is processed as a batch
2. Online processing
 - a. Opposite of batch processing
 - b. Transactions are not grouped into batches, but each transactions is entered and processed one at a time
 - c. Some online processing systems are also real-time processing systems, meaning that the transaction is processed immediately, and in real time, so that the output is available immediately

DATA WAREHOUSE AND DATA MINING

A **data warehouse** is an integrated collection of enterprise-wide data that includes five to ten fiscal years of nonvolatile data, used to support management in decision making and planning. The data warehouse can be better understood by comparing it with the operational database. **The operational database** contains the data that are continually updated as transactions are processed. Usually, the operational database includes data for the current fiscal year and supports day-to-day operations and record keeping for the transaction processing systems. Each time a new transaction is completed, parts of the operational database must be updated.

The data warehouse is used by management to do data mining. **Data mining** is the process of searching data within the data warehouse for identifiable patterns that can be used to predict future behavior. Although there are many reasons a company might want to know future behavior, the most popular use of data mining is to predict the future buying behavior of customers

NETWORKS AND THE INTERNET

- A **computer network** is two or more computers linked together to share information and/or resources
- A **LAN** is a computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings and are intended to connect computers within an organization. However, one LAN can be connected to other LANs over any distance via other network connections. A system of LANs connected in this way is called a WAN, or wide area network.

- The **Internet** is the global computer network, or “information super-high- way.” The Internet developed from a variety of university- and government- sponsored computer networks that have evolved and are now made up of millions upon millions of computers and subnetworks throughout the world. The Internet is the network that serves as the backbone for the World Wide Web (WWW).
- An **intranet** is a company’s private network accessible only to the employ- ees of that company. The intranet uses the common standards and protocols of the Internet. However, the computer servers of the intranet are accessible only from internal computers within the company.
- An **extranet** is similar to an intranet except that it offers access to selected outsiders, such as buyers, suppliers, distributors, and wholesalers in the supply chain. Extranets allow business partners to exchange information. These busi- ness partners may be given limited access to company servers and access only to the data necessary to conduct supply chain exchanges with the company

EXAMPLES OF IT ENABLEMENT (STUDY OBJECTIVE 6)

Examples of systems applied by companies today that use IT-enabled business processes:

- E-Business
 - the use of electronic means to enhance business processes
 - encompasses all forms of online electronic trading—consumer- based e-commerce and business-to-business transactions, as well as the use of IT for process integration inside organizations
- Electronic Data Interchange (EDI)
 - the intercompany, computer-to-computer transfer of business documents in a standard business format
- Point of Sales system
 - a system of hardware and software that captures retail sales transactions by standard bar coding. Nearly all large retail and grocery stores use POS systems that are integrated into the cash register
- Automated Matching
 - a computer hardware and software system in which the software matches an invoice to its related purchase order and receiving report. Traditional systems rely on a person to do this matching, whereas an automated matching system does not.
- Evaluated receipt Settlement
 - is an invoice-less system in which computer hardware and software complete an invoice-less match comparing the purchase order with the goods received
- E-Payables and Electronic Invoice Presentment and Payment
 - are both terms that refer to Web-enabled receipt and payment of vendor invoices. EIPP enables a vendor to present an invoice to its trading partner via the Internet, eliminating the paper, printing, and postage costs of traditional paper invoicing.
- Enterprise Resource Planning Systems
 - is a multi-module software system designed to manage all aspects of an enterprise
 - ERP software system is much more comprehensive and encompassing than traditional accounting software. ERP systems include modules to handle accounting functions, but, as previously mentioned, they also incorporate modules for manufacturing, marketing, logistics, and human resources

THE INTERNAL CONTROL STRUCTURE OF ORGANIZATIONS (STUDY OBJECTIVE 7)

Accountants have a long history of being the professionals within the organization who help design and implement controls to lessen risks that have an impact on the financial standing of the organization. Accountants are usually experts in controls that can reduce risks in the following broad categories:

1. The risk that assets will be stolen or misused
2. The risk of errors in accounting data or information
3. The risk of fraudulent activity by employees, managers, customers, or vendors
4. The risks inherent in IT systems, such as
 - a. Erroneous input of data
 - b. Erroneous processing of data
 - c. Computer fraud
 - d. Computer security breaches
 - e. Hardware or software failure
 - f. Natural disasters that can interrupt computer system operations

Although management has the ultimate responsibility to establish a control environment to mitigate these risks to the extent to which it can reasonably do so, accountants are heavily involved in assisting management in the creation, implementation, and ongoing monitoring of the control environment. Management should ensure that the following types of control structures exist:

1. Enterprise risk management (summarized in the next subsection)
2. Code of ethics (Chapter 3)
3. COSO accounting internal control structure (Chapter 3)
4. IT system control structure (Chapter 4)
5. Corporate governance structure (Chapter 5)
6. IT governance structure (Chapter 6)

ENTERPRISE RISK MANAGEMENT

Enterprise risk management (ERM) is defined as

- a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.²

ERM requires that management set policies and procedures related to the following:

- Internal Environment
- Objective Setting
- Event Identification
- Risk Assessment
- Risk Response
- Control Activities
- Information and Communication
- Monitoring

In addition to its ERM guidance, COSO is well known for its "Internal Controls— Integrated Framework," which explains

what has become the standard accepted by the accounting and business community as the definition and description of internal control. According to this framework, there are five interrelated components of internal control:

- the control environment,
- risk assessment,
- control activities,
- information and communication,
- and monitoring

IT CONTROLS

Threats and risks that interrupt or stop computer operations can be severely damaging to the organization. Not only can they halt or disrupt normal operations; they can lead to incorrect or incomplete accounting information. An organization must institute controls to limit these risk in IT systems.

IT Controls can be divided into two categories:

1. General controls
2. Application controls

CORPORATE GOVERNANCE

Corporate governance is an elaborate system of checks and balances whereby a company's leadership is held accountable for building shareholder value and creating confidence in the financial reporting processes. This system of checks and balances includes several corporate functions that are interrelated within the corporate governance system, including management oversight, internal controls and compliance, financial stewardship, and ethical conduct

Corporate governance has been tremendously affected by the Sarbanes–Oxley Act of 2002. The purpose of the Act was to improve financial reporting and reinforce the importance of corporate ethics. The legislation was enacted in an effort to curb the corruption and accounting blunders that had been discovered in connection with the bankruptcies of such corporate giants as Enron Corp. and WorldCom Inc. The Sarbanes–Oxley Act places a huge responsibility on top management to establish and maintain internal controls. (Corporate governance and the Sarbanes–Oxley Act are described in detail in Chapter 5.)

IT GOVERNANCE

The IT Governance Institute defines IT governance as

- the leadership, organizational structure, and processes that ensure that the enterprise achieve(s) its goals by adding value while balancing risk versus return over IT and its processes. IT governance provides the structure that links IT processes, IT resources, and information to enterprise strategies and objectives.⁴

To fulfill the management obligations that are inherent in IT governance, management must focus on the following aspects:

- Aligning IT strategy with the business strategy Cascading strategy and goals down into the enterprise
- Providing organizational structures that facilitate the implementation of strategies and goals
- Insisting that an IT control framework be adopted and implemented

THE IMPORTANCE OF ACCOUNTING INFORMATION SYSTEMS TO ACCOUNTANTS (STUDY OBJECTIVE 8)

Anyone pursuing an accounting career must study and understand accounting information systems (AIS) and the related concepts. No matter which particular career path is chosen within accounting, it will in some manner involve the use of an accounting information system. Accountants have several possible roles related to accounting information systems: They may be:

- Users of the AIS
- Design or Implementation team
- An auditor of the AIS

THE RELATION OF ETHICS TO ACCOUNTING INFORMATION SYSTEMS (STUDY OBJECTIVE 9)

Unfortunately, there are many opportunities for unethical or fraudulent behavior related to accounting information systems. Accounting information systems can be misused to assist in committing unethical acts or helping to hide unethical acts. That is, the AIS is often the tool used to commit or cover up unethical behavior. Examples of potential unethical behavior include:

- Fraudulent financial reporting
- Revenue inflation
- Expense account fraud
- Inflating hours worked for payroll purposes
- Computer fraud
- Hacking
- Browsing confidential data

For many reasons, accountants must become aware of the potential unethical behaviors. Some of those reasons are that accountants

1. Assist in developing and implementing internal control structures that should lessen the chance of unethical actions. Those in this role must understand the nature of the various kinds of unethical actions before they can design a system to lessen the risk.
2. Are often pressured to assist in, or cover up, unethical actions. Therefore, accountants must understand what actions are ethical and unethical so that they can avoid being coerced into unethical actions.
3. Deal with assets or records that could easily tempt accountants to engage in unethical behavior. For example, someone who handles cash every day may be tempted to steal some of the cash. Accountants have control over or recording responsibilities for many assets. When professional accountants face ongoing temptation, having a better understanding of which actions are unethical may help them to resist temptation to commit unethical acts.

CHAPTER SUMMARY

- **Introduction To Business Processes.** A business process is a prescribed sequence of work steps performed in order to produce a desired result for the organization. In accounting information system, business processes can be categorized into four types: revenue (or sales) processes; expenditure processes; conversion processes; and administrative processes. Employees, work steps, and transaction recording systems must be established to insure that business processes occur, and the accounting effects of these processes are captured and recorded.
- **The Accounting Information System.** The accounting information system is the set of processes, procedures, and systems that capture, record, process, summarize, and report accounting information. There are five important components to an accounting information system.
 1. Work steps to capture accounting data as transactions occur
 2. Recording of accounting data in manual or computerized records
 3. Work steps that are internal controls to prevent or detect errors and fraud
 4. Work steps to process, classify, summarize, and consolidate raw accounting data
 5. Work steps that generate internal and external reports from the processed accounting data
- **Business Processes Throughout The Supply Chain.** A business has many linkages with external suppliers, distributors, and customers. These linkages are called the supply chain. A business should monitor and control the entire set of processes throughout the supply chain to improve efficiency. IT enablement of these processes can lead to improved efficiency.
- **IT Enablement Of Business Processes And The AIS.** IT Enablement is the application of information technology to accomplish any or all of the following three: improve the efficiency of business processes, reduce cost of business processes, or increase the accuracy of data from business processes. Often the IT enablement is accompanied by Business Process Reengineering (BPR), which is the redesign of business processes to make them more efficient. BPR should leverage the capabilities of IT to improve business processes. IT Capabilities should support the business process, and the business process should be designed to match the capabilities of the IT system.
- **Basic Computer And IT Concepts**
 - **Basic Computer Data Structures.** A computer data hierarchy is bit, byte, field, record, file, database. A relational database stores data in tables joined in ways that can represent many different relationships among the data. A master file is the set of relatively permanent records for major processes. A transaction file is the set of relatively temporary records that will be processed to update the master file.
 - **File Access And Processing Modes.** Files may be stored in sequential access, random access, or index sequential access method. How files are stored and processed is inter-related. Processing can be accomplished via batch processing, online processing, or online, real-time processing.
 - **Data Warehouse And Data Mining.** A data warehouse is an integrated collection of enterprise-wide data that includes five to ten years of nonvolatile data. Data mining is used to search and analyze the data warehouse for identifiable patterns that can be used to predict future behavior.
 - **Networks And The Internet.** A network is two or more computers linked together to share information or resources. A LAN is a local area network, a WAN is a wide area network. The Internet is the global network often described as the World Wide Web. An intranet is a private network within the company accessible only by employees. An extranet is a network accessible only to internal employees and external members of the supply chain, but not the entire public.
- **Examples Of IT Enablement.** The following are examples of using IT systems to improve business processes.
 - **E-Business.** E-business encompasses all forms of online electronic trading – consumer-based e-commerce and business-to-business electronic trading - and business-to-business process integration, as well as the internal use of IT and related technologies for process integration inside organizations. IT systems, Internet, and websites, as well as wireless networks, are the common means of enabling e-business to occur.
 - **Electronic Data Interchange.** EDI is the inter company, computer-to-computer transfer of business documents in a standard business format. EDI is used to transmit purchase orders, invoices, and payments electronically between trading partners.

- **Point Of Sale Systems.** A point of sale system (POS) is a system of hardware and software that captures retail sales transactions by standard bar coding. These processes occur in real time, and through POS-captured data the store can provide to its managers or home office daily summaries of sales by cash register or by product.
- **Automated Matching.** Automated matching is a computer hardware and software system in which the software matches an invoice to its related purchase order and receiving report. The system can access the online purchase order and receiving files and verify that the items, quantities, and prices match. The system will not approve an invoice for payment unless the items and quantities match with the packing slip and the prices match the purchase order prices.
- **Evaluated Receipt Settlement.** Evaluated receipt settlement (ERS) is an invoice-less system in which computer hardware and software complete an invoice-less match that is a comparison of the purchase order with the goods received. The name ERS signifies that the receipt of goods is carefully evaluated and, if it matches the purchase order, settlement of the obligation occurs through this system.
- **E-Payables And Electronic Invoice Presentment And Payment.** E-payables and electronic invoice presentment and payment (EIPP) are both terms that refer to Web-enabled receipt and payment of vendor invoices. EIPP enables a vendor to present an invoice to its trading partner via the Internet, eliminating the paper, printing, and postage costs of traditional paper invoicing.
- **Enterprise Resource Planning Systems.** Enterprise resource planning (ERP) is a multi-module software system designed to manage all aspects of an enterprise. ERP systems are usually broken down into modules such as financials, sales, purchasing, inventory management, manufacturing, and human resources. The modules are designed to work seamlessly with the rest of the system and to provide a consistent user interface between modules.
- **Block Chain Technology and Potential Future Effects of Blockchain Technology**

Many accounting and finance professionals believe that blockchain technology will be used to revolutionize financial transactions, the accompanying financial records, and auditing those financial records. Currently, it is too early to determine if these expectations are accurate, but it is important for any accounting professional to become familiar with evolving technology that potentially changes accounting or auditing. Therefore, this chapter and a few other chapters describe aspects of how blockchain technology may affect accounting and auditing. You may have read or heard of the term blockchain if you have heard of the cryptocurrency Bitcoin, a virtual currency. Blockchain is the underlying internet-based technology and recording system that allows the virtual trading of Bitcoin and the records of Bitcoin trading and holding. The use and impact of blockchain technology is rapidly expanding into all aspects of financial transactions and banking.

Since the early days of accounting, each company has owned and maintained their own accounting ledgers and journals, which are today computer-based journals and ledgers. Because each company maintains its own separate accounting records, a transaction between company A and company B could possibly be recorded in two different manners, amounts, or timing. Blockchain could radically change this centuries-old practice of separate accounting ledgers. Experts in blockchain see it as an extensive improvement over current accounting systems. It is a shared ledger system wherein both parties (Company A and Company B) must agree on the amounts and details of a transaction before it is added to the blockchain data, a shared, encrypted, and secure database. Once added to the blockchain, it is not possible to alter it. This characteristic means that the blockchain data is immutable, or unchangeable over time.

This single version of the truth (i.e., the actual details of a transaction that are immutable and up-to-date data) can be accessed by all networked organizations that are a party to the transaction. Therefore, differences between the recording of data between companies is reduced or eliminated. This fact also reduces the need to reconcile differences between ledgers because there is one “true” version of the transaction details in the shared, distributed ledger. Since all affected parties must agree before data is added to the blockchain, and because the data is immutable once recorded, it is nearly impossible to fraudulently alter it.

IBM describes this aspect of blockchain records in the following manner¹.

- Single, shared, tamper-evident ledger — once recorded, transactions cannot be altered.
- All parties must give consensus before a new transaction is added to the network
- Eliminates or reduces paper processes, speeding up transaction times and increasing efficiencies

Experts in the future of accounting believe the blockchain technology will be used to alter accounting such that it becomes triple entry rather than double entry, with the third entry visible to all blockchain network participants. As that transition occurs, companies may still maintain separate ledgers, but also have a third entry for each transaction into the blockchain. A simple representation of a third entry in a blockchain system is in Exhibit ??.

Exhibit ??

Company A Ledger		Company B Ledger	
DEBITS	CREDITS	DEBITS	CREDITS
400			400
	550	550	
800			800

Distributed Ledger	
A	B
-400	400
550	-550
-800	800

This block of data is then chained to other blocks of data and hence, the name blockchain. This blockchain data is immutable and up-to-date. The entire blockchain is stored in distributed nodes, or servers, across the globe. Later chapters will describe aspects of the possible impacts on accounting and auditing.

- **The Control Environment Of Organizations.** Managers can undertake steps to lessen the risks faced by the organization. This ability to lessen risks or risk impacts is true of nearly all risks that organizations face. Management can undertake steps to lessen the risk or reduce the impact of the risk. These processes are called controls. Accountants have a long history of being the professionals within the organization who help design and implement controls to lessen risks that have an impact on the financial standing of the organization.
- **Enterprise Risk Management.** Enterprise Risk Management (ERM) is defined as a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.

¹ Blockchain 101, IBM ®, retrieved from <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=45015045USEN&> on January 6, 2019.

- **A Code Of Ethics.** A company should develop and adhere to a code of ethics to reduce opportunities for managers or employees to conduct fraud. A code of ethics is most effective if top management emphasizes this code of ethics and disciplines or discharges those who violate it. Managers who emphasize and model ethical behavior are more likely to encourage ethical behavior in their employees.
- **COSO Accounting Internal Control Structure.** COSO identifies five interrelated components of internal control: the control environment, risk assessment, control activities, information and communication, and monitoring.
- **IT Controls.** IT controls can be divided into two categories, general controls and application controls. General controls apply overall to the IT accounting system; they are not restricted to any particular accounting application. An example of a general control is the use of passwords to allow only authorized users to log into an IT- based accounting system. Without regard to processing data in any specific application, passwords should be employed in the IT system. Application controls are used specifically in accounting applications to control inputs, processing, and output.
- **Corporate Governance.** Corporate governance is an elaborate system of checks and balances whereby a company's leadership is held accountable for building shareholder value and creating confidence in the financial reporting processes. This system of checks and balances includes several corporate functions that are interrelated within the corporate governance system. These functions include management oversight, internal controls and compliance, financial stewardship, and ethical conduct.
- **IT Governance.** IT governance is a structure of relationships and processes to direct and control the enterprise in order to achieve the enterprise's goals by adding value while balancing risk versus return over IT and its processes. IT governance provides the structure that links IT processes, IT resources and information to enterprise strategies and objectives.
- **The Accountant's Role In AIS.** All career paths within accounting will in some manner involve the use of an accounting information system. Accountants have several possible roles related to accounting information systems: They may be users of the AIS, part of the design or implementation team of an AIS, and/or auditors of an AIS.
 - **Users Of The AIS.** Accountants within any organization must use the accounting information system to accomplish the functions of accounting, generating accounting reports, and using accounting reports. Accountants must therefore understand AIS concepts in order to perform these accounting jobs.
 - **Design And Implementation Teams.** Accountants are usually part of a multiple-discipline team that designs and/or implements accounting information systems. When an organization considers a change to its AIS, accountants must be involved in decisions related to such matters as evaluating which software to purchase, how to design software or systems, and the implementation of software or systems.
 - **An Auditor Of The AIS.** Auditors conduct assurance services such as a financial audit. To conduct an audit, the auditor must collect evidence and make judgments regarding the completeness and accuracy of accounting information. The auditor cannot make informed decisions necessary to complete the audit without an understanding of the accounting information system.
- **Ethics And The AIS.** Accounting information systems can be misused to assist in committing unethical acts or helping to hide unethical acts. That is, the AIS is often the tool used to commit or cover up unethical behavior. Examples of some potential unethical behaviors are: fraudulent financial reporting; revenue inflation; expense account fraud; inflating hours worked for payroll purposes; computer fraud; hacking; browsing confidential data.