Lecture three

Overview of Business Processes

1

INTRODUCTION

- Questions to be addressed in this class include:
  - What are the basic business processes in which an organization engages?
    - What decisions must be made to undertake these processes?
    - What information is required to make those decisions?
  - What role does the data processing cycle play in organizing business processes and providing information to users?
  - What is the role of the information system and enterprise resource planning in modern organizations?

2

INFORMATION NEEDS AND BUSINESS PROCESSES

- Businesses engage in a variety of processes, including:
  - Acquiring capital
  - Buying buildings and equipment
  - Hiring and training employees
  - Purchasing inventory
  - Doing advertising and marketing
  - Selling goods or services
  - Collecting payment from customers
  - Paying employees
  - Paying taxes
  - Paying vendors

Each activity requires different types of decisions.

3

INFORMATION NEEDS AND BUSINESS PROCESSES

- Types of information needed for decisions:
  - Some is financial
  - Some is nonfinancial
  - Some comes from internal sources
  - Some comes from external sources
- An effective AIS needs to be able to integrate information of different types and from different sources.

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BUSINESS CYCLES

- A ***transaction*** is:
  - An agreement between two entities to exchange goods or services; OR
  - Any other event that can be measured in economic terms by an organization.
- EXAMPLES:
  - Sell goods to customers
  - Depreciate equipment

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BUSINESS CYCLES

- The business transaction cycle is a process that:
  - Begins with capturing data about a transaction.
  - Ends with an information output, such as financial statements.

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BUSINESS CYCLES

- Many business processes are paired in give-get exchanges.
- Basic exchanges can be grouped into five major cycles:
  - Revenue cycle
  - Expenditure cycle
  - Production cycle
  - Human resources/payroll cycle
  - Financing cycle

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BUSINESS CYCLES

- Thousands of transactions can occur within any of these cycles.
- But there are relatively few ***types*** of transactions in a cycle.

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BUSINESS CYCLES

- EXAMPLE: In the revenue cycle, the basic give-get transaction is:
  - Give goods
  - Get cash

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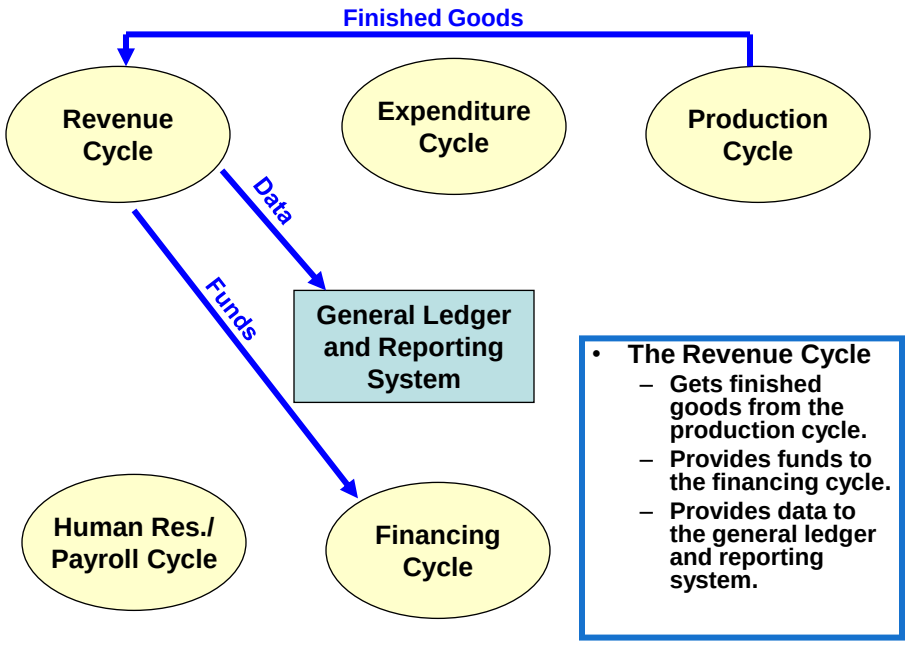
BUSINESS CYCLES

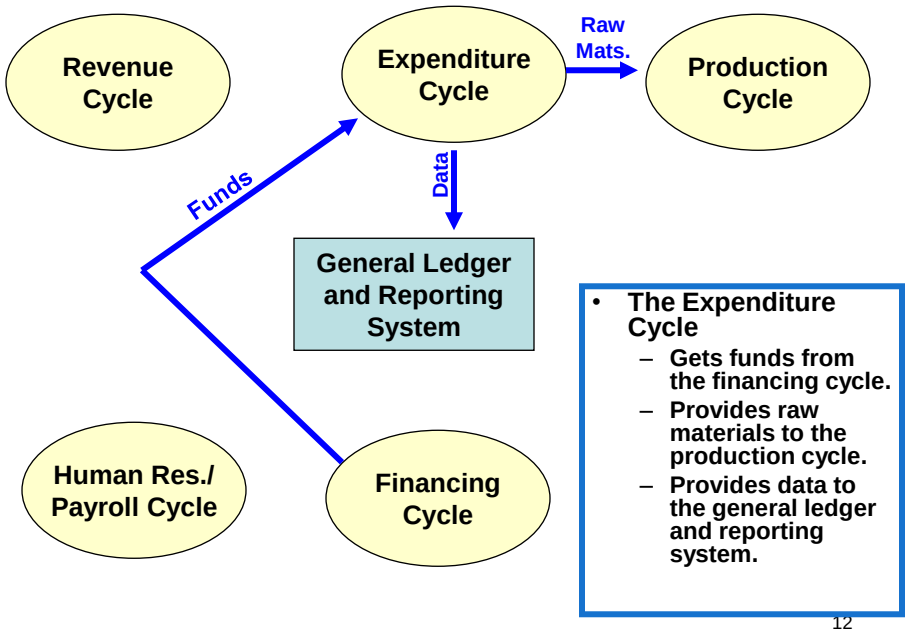
- Every transaction cycle:
  - Relates to other cycles.
  - Interfaces with the general ledger and reporting system, which generates information for management and external parties.

10



- The Revenue Cycle
  - Gets finished goods from the production cycle.
  - Provides funds to the financing cycle.
  - Provides data to the general ledger and reporting system.

11



- The Expenditure Cycle
  - Gets funds from the financing cycle.
  - Provides raw materials to the production cycle.
  - Provides data to the general ledger and reporting system.

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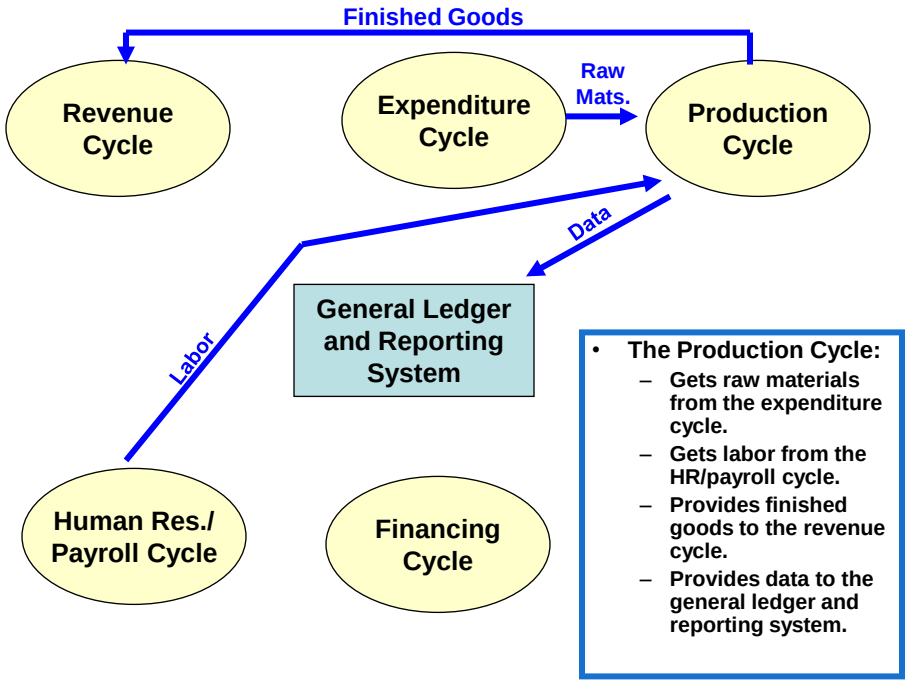
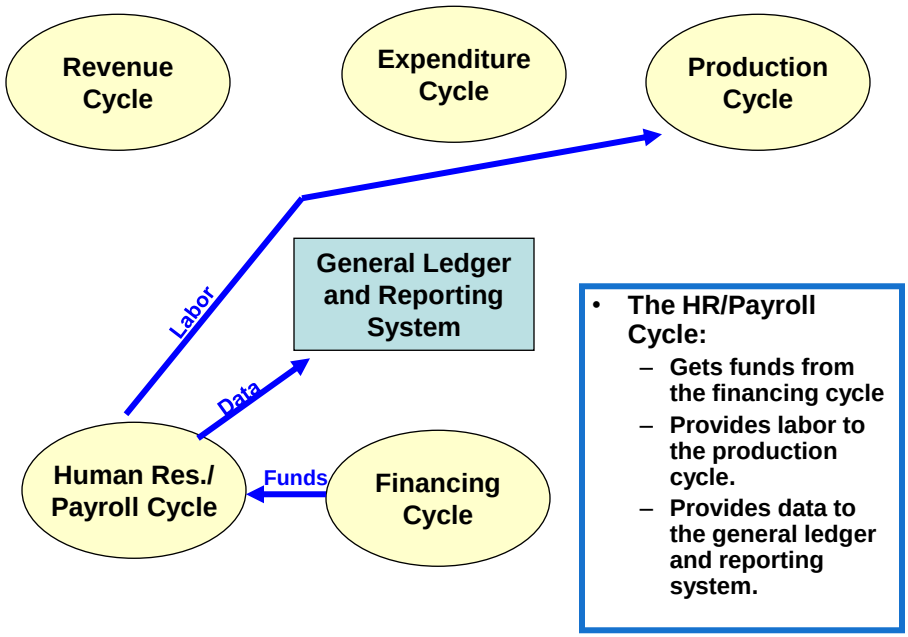
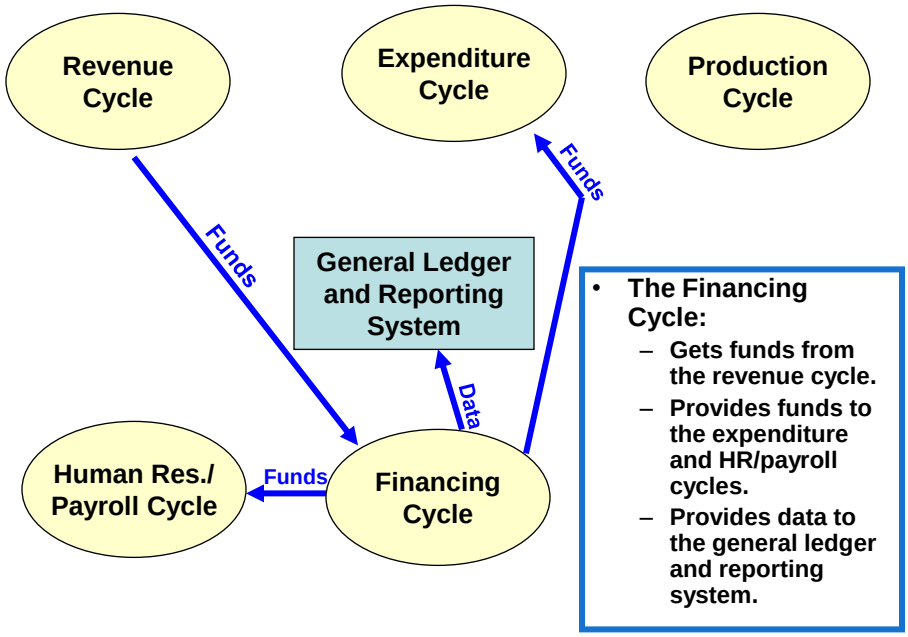
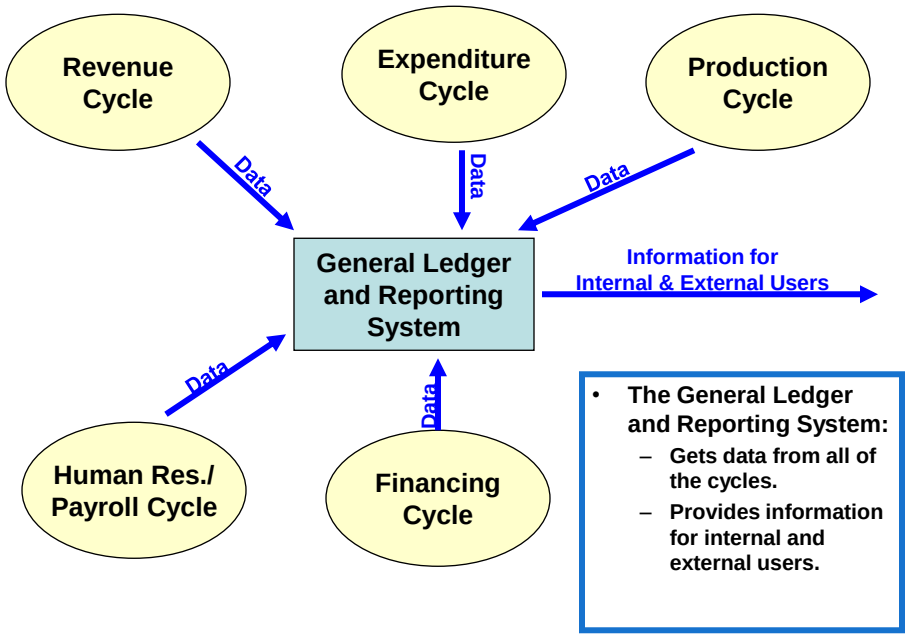


- The Production Cycle:
  - Gets raw materials from the expenditure cycle.
  - Gets labor from the HR/payroll cycle.
  - Provides finished goods to the revenue cycle.
  - Provides data to the general ledger and reporting system.



- The HR/Payroll Cycle:
  - Gets funds from the financing cycle
  - Provides labor to the production cycle.
  - Provides data to the general ledger and reporting system.


Revenue Cycle
Expenditure Cycle
Production Cycle
Funds
Funds
General Ledger and Reporting System
Data
Human Res./ Payroll Cycle
Funds
Financing Cycle
• The Financing Cycle:
– Gets funds from the revenue cycle.
– Provides funds to the expenditure and HR/payroll cycles.
– Provides data to the general ledger and reporting system.


Revenue Cycle
Expenditure Cycle
Production Cycle
Data
Data
Data
General Ledger and Reporting System
Information for Internal & External Users
Data
Data
Human Res./ Payroll Cycle
Financing Cycle
• The General Ledger and Reporting System:
– Gets data from all of the cycles.
– Provides information for internal and external users.

BUSINESS CYCLES

- Many accounting software packages implement the different transaction cycles as separate modules.
  - Not every module is needed in every organization, e.g., retail companies don’t have a production cycle.
  - Some companies may need extra modules.
  - The implementation of each transaction cycle can differ significantly across companies.

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BUSINESS CYCLES

- However the cycles are implemented, it is critical that the AIS be able to:
  - Accommodate the information needs of managers.
  - Integrate financial and nonfinancial data.

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TRANSACTION PROCESSING: THE DATA PROCESSING CYCLE

- Accountants play an important role in data processing. They answer questions such as:
  - What data should be entered and stored?
  - Who should be able to access the data?
  - How should the data be organized, updated, stored, accessed, and retrieved?
  - How can scheduled and unanticipated information needs be met?
- To answer these questions, they must understand data processing concepts.

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TRANSACTION PROCESSING: THE DATA PROCESSING CYCLE

- An important function of the AIS is to efficiently and effectively process the data about a company's transactions.
  - In ***manual*** systems, data is entered into paper journals and ledgers.
  - In ***computer-based*** systems, the series of operations performed on data is referred to as the data processing cycle.

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TRANSACTION PROCESSING: THE DATA PROCESSING CYCLE

- The data processing cycle consists of four steps:
  - Data input
  - Data storage
  - Data processing
  - Information output

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DATA INPUT

- The first step in data processing is to capture the data.
- Usually triggered by a business activity.
- Data is captured about:
  - The ***event*** that occurred.
  - The ***resources*** affected by the event.
  - The ***agents*** who participated.

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DATA INPUT

- A number of actions can be taken to improve the accuracy and efficiency of data input:
  - Turnaround documents.
  - Source data automation.
  - Well-designed source documents and data entry screens.
  - Using pre-numbered documents or having the system automatically assign sequential numbers to transactions.
  - Verify transactions.

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DATA STORAGE

- Data needs to be organized for easy and efficient access.
- Data storage terminologies .
  - Ledger
  - General ledger
  - Subsidiary ledger
  - Coding techniques
  - Chart of accounts
  - Journals
  - Audit trail

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DATA STORAGE

- **Ledger**
  - A ***ledger*** is a file used to store cumulative information about resources and agents. We typically use the word ***ledger*** to describe the set of t-accounts. The t-account is where we keep track of the beginning balance, increases, decreases, and ending balance for each asset, liability, owners' equity, revenue, expense, gain, loss, and dividend account.

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DATA STORAGE

- **Ledger**
  - Following is an example of a ledger account for accounts receivable:

GENERAL LEDGER

ACCOUNT: Accounts Receivable Account Number: 120

Date	Description	Post Ref	Debit	Credit	Balance
01/01/05					42,069.00
01/03/05	Sales	S03	1,300.00		43,369.00
01/13/05	Cash collections	CR09		4,600.00	38,769.00
01/23/05	Sales	S04	5,600.00		44,369.00

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General ledger

- The *general ledger* is the summary level information for all accounts. Detail information is not kept in this account.
  - Example: Suppose XYZ Co. has three customers. Anthony Adams owes XYZ $100. Bill Brown owes $200. And Cory Campbell owes XYZ $300. The balance in accounts receivable in the general ledger will be $600, but you will not be able to tell how much individual customers owe by looking at that account. The detail isn't there.

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Subsidiary ledger

- The subsidiary ledgers contain the detail accounts associated with the related general ledger account. The accounts receivable subsidiary ledger will contain three separate t-accounts—one for Anthony Adams, one for Bill Brown, and one for Cory Campbell.
- The related general ledger account is often called a "control" account.
- The sum of the subsidiary account balances should equal the balance in the control account.

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Coding techniques

- **Coding is a method of systematically assigning numbers or letters to data items to help classify and organize them. There are many types of codes including:**
  - **Sequence codes**
  - **Block codes**
  - **Group codes**

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Coding techniques

- **With *sequence codes*, items (such as checks or invoices) are numbered consecutively to ensure no gaps in the sequence. The numbering helps ensure that:**
  - **All items are accounted for.**
  - **There are no duplicated numbers, which would suggest errors or fraud.**
- **When *block codes* are used, blocks of numbers within a numerical sequence are reserved for a particular category.**
- **EXAMPLE: The first three digits of a Social Security number make up a block code that indicates the state in which the Social Security number was issued:**
  - **001–003 New Hampshire**
  - **004–007 Maine**
  - **008–009 Vermont**

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Coding techniques

- When ***group codes*** are used, two or more subgroups of digits are used to code an item.
- EXAMPLE: The code in the upper, right-hand corner of many checks is a group code organized as follows:
  - Digits 1–2 Bank number
  - Digit 3 Federal Reserve District
  - Digits 4–7 Branch office of Federal Reserve
  - Digits 8–9 State

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Coding techniques

- Group coding schemes are often used in assigning general ledger account numbers. The following guidelines should be observed:
  - The code should be consistent with its intended use, so make sure you know what users need.
  - Provide enough digits to allow room for growth.
  - Keep it simple in order to:
    - Minimize costs
    - Facilitate memorization
    - Ensure employee acceptance
  - Make sure it's consistent with:
    - The company's organization structure
    - Other divisions of the organization

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Chart of accounts

- The ***chart of accounts*** is a list of all general ledger accounts an organization uses.
- Group coding is often used for these numbers, e.g.:
  - The first section identifies the major account categories, such as asset, liability, revenue, etc.
  - The second section identifies the primary sub-account, such as current asset or long-term investment.
  - The third section identifies the specific account, such as accounts receivable or inventory.
  - The fourth section identifies the subsidiary account, e.g., the specific customer code for an account receivable.
- The structure of this chart is an important AIS issue, as it must contain sufficient detail to meet the organization's needs.

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DATA STORAGE

- In manual systems and some accounting packages, the first place that transactions are entered is the journal.
  - A general journal is used to record:
    - Non-routine transactions, such as loan payments
    - Summaries of routine transactions
    - Adjusting entries
    - Closing entries
  - A special journal is used to record routine transactions. The most common special journals are:
    - Cash receipts
    - Cash disbursements
    - Credit sales
    - Credit purchases

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Audit trail

- **An audit trail exists when there is sufficient documentation to allow the tracing of a transaction from beginning to end or from the end back to the beginning.**
- **The inclusion of posting references and document numbers enable the tracing of transactions through the journals and ledgers and therefore facilitate the audit trail.**

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DATA STORAGE

- Now that we've learned some storage terminology, let's return to the data storage process.
- When transaction data is captured on a source document, the next step is to record the data in a journal.
- A journal entry is made for each transaction showing the accounts and amounts to be credited.

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DATA STORAGE

- In your principles of financial accounting class, you worked with journals that looked something like this:

01/15/04	**Accounts receivable**	**2,200**	
	Sales revenue		**2,200**
01/18/04	**Cash**	**1,800**	
	Accounts receivable		**1,800**
01/21/04	**Salaries expense**	**900**	
	Cash		**900**

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DATA STORAGE

- You have not gotten much experience with special journals, but in most real-world situations, journal entries really work like this.
  - Entries are originally made in the general journal only for:
    - ***Non-routine*** transactions
    - Summaries of routine transactions
  - Routine transactions are originally entered in special journals. The some common special journals are:
    - Credit sales
    - Cash receipts
    - Credit purchases
    - Cash disbursements

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DATA STORAGE--Example

- On December 1, a sale is made to Lee Co. for $800. Lee Co. was sent Invoice No. 201.

Page 5	Sales Journal				
Date	Invoice Number	Account Debited	Account Number	Post Ref.	Amount
12/01/04	201	Lee Co.	120-122		800.00

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DATA STORAGE--Example

- The general ledger account number for accounts receivable is No. 120. Lee Co. was the 122nd customer, so their subsidiary account number is 120-122.

Page 5	Sales Journal				
Date	Invoice Number	Account Debited	Account Number	Post Ref.	Amount
12/01/04	201	Lee Co.	120-122		800.00

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DATA STORAGE--Example

- The next sale on December 1 was made to May Co. for $700.

Page 5

Sales Journal

Date	Invoice Number	Account Debited	Account Number	Post Ref.	Amount
12/01/04	201	Lee Co.	120-122		800.00
12/01/04	202	May Co.	120-033		700.00

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DATA STORAGE--Example

- The third and final sale on December 1 was made to DLK Co. for $900.

Page 5

Sales Journal

Date	Invoice Number	Account Debited	Account Number	Post Ref.	Amount
12/01/04	201	Lee Co.	120-122		800.00
12/01/04	202	May Co.	120-033		700.00
12/01/04	203	DLK Co.	120-111		900.00

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DATA STORAGE--Example

- Suppose the company making these sales, posts transactions at the end of each day. Consequently, at day's end, they will post each individual transaction to the accounts receivable subsidiary ledger:
  - An $800 increase in accounts receivable (debit) will be posted to Lee Co.'s subsidiary account (120-122).
  - A $700 debit will be posted to May Co.'s subsidiary account (120-033).
  - A $900 debit will be posted to DLK Co.'s subsidiary account (120-111).

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DATA STORAGE--Example

- Then a summary journal entry must be made to the general journal. The sales for the period are totaled. In this case, they add up to $2,400.

Page 5	Sales Journal				
Date	Invoice Number	Account Debited	Account Number	Post Ref.	Amount
12/01/04	201	Lee Co.	120-122		800.00
12/01/04	202	May Co.	120-033		700.00
12/01/04	203	DLK Co.	120-111		900.00
			TOTAL		2,400.00
					120/502

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DATA STORAGE--Example

- The “120/502” that appears beneath the total indicates that a summary journal entry is made in the general journal with a debit to accounts receivable (120) and a credit to sales (502).

Page 5	Sales Journal				
Date	Invoice Number	Account Debited	Account Number	Post Ref.	Amount
12/01/04	201	Lee Co.	120-122		800.00
12/01/04	202	May Co.	120-033		700.00
12/01/04	203	DLK Co.	120-111		900.00
			TOTAL		2,400.00
					120/502

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DATA STORAGE--Example

- The entries in the general journal are periodically (or automatically) posted to the general ledger. The $2,400 debit to accounts receivable will be posted to the accounts receivable control account, and the $2,400 credit will be posted to the general ledger account for sales.

12/01/04	Accounts receivable	2,400	
	Sales revenue		2,400
12/01/04	Cash	1,800	
	Accounts receivable		1,800
12/01/04	Salaries expense	900	
	Cash		900

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DATA STORAGE--Example

- From time to time, the subsidiary account balances will be added up, and this sum will be compared to the balance of the control account.
- What does it mean if they aren't equal?

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DATA STORAGE

- Review so far:
  - When ***routine transactions*** occur, they are recorded in ***special journals***.
  - When ***non-routine transactions*** occur, they are recorded in the ***general journal***.
  - Periodically, the transactions in the special journal are totaled, and a summary entry is made in the general journal.
  - The individual line items in the special journal are posted to the subsidiary ledger accounts.
  - The items in the general journal are posted to the general ledger.
  - Periodically, the balances in the general ledger control accounts are compared to the sums of the balances in the related subsidiary accounts.

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COMPUTER-BASED STORAGE CONCEPTS

- Now let's move on to discussing some computer-based storage concepts, including:
  - Entity
  - Attribute
  - Record
  - Data Value
  - Field
  - File
  - Master File
  - Transaction File
  - Database

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COMPUTER-BASED STORAGE CONCEPTS

- An **entity** is something about which information is stored. (Table or file)
- In your university's student information system, one entity is the student. The student information system stores information about students.
- What are some other entities in your student information system?

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COMPUTER-BASED STORAGE CONCEPTS

- **Attributes** are characteristics of interest with respect to the entity. (fields or columns)
- Some attributes that a student information system typically stores about the student entity are:
  - Student ID number
  - Phone number
  - Address
- What are some other attributes about students that a university might store?

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COMPUTER-BASED STORAGE CONCEPTS

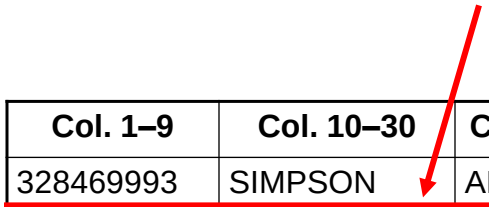
- A field is the physical space where an attribute is stored.
- The space where the student ID number is stored is the student ID field.

Col. 1–9	Col. 10–30	Col. 31–40	Col. 41–50
328469993	SIMPSON	ALICE	4053721111
328500732	ANDREWS	BARRY	4057440236
529036409	FLANDERS	CARLA	4057475863

55

COMPUTER-BASED STORAGE CONCEPTS

- A record is the set of attributes stored for a particular instance of an entity. (row)
- The combination of attributes stored for Barry Andrews is Barry's record.



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328500732	ANDREWS	BARRY	4057440236
529036409	FLANDERS	CARLA	4057475863

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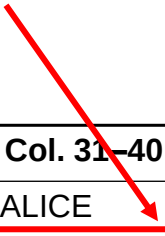
COMPUTER-BASED STORAGE CONCEPTS

- A data value is the intersection of the row and column.
- The data value for Barry Andrews' phone number is 405-744-0236.



Col. 1–9	Col. 10–30	Col. 31–40	Col. 41–50
328469993	SIMPSON	ALICE	4053721111
328500732	ANDREWS	BARRY	4057440236
529036409	FLANDERS	CARLA	4057475863

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COMPUTER-BASED STORAGE CONCEPTS

- A file is a group of related records. (aka Table)
- The collection of records about all students at the university might be called the student file. If there were only three students and four attributes stored for each student, the file might appear as shown below:

Col. 1–9	Col. 10–30	Col. 31–40	Col. 41–50
328469993	SIMPSON	ALICE	4053721111
328500732	ANDREWS	BARRY	4057440236
529036409	FLANDERS	CARLA	4057475863

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COMPUTER-BASED STORAGE CONCEPTS

- A **master file** is a file that stores cumulative information about an organization's entities.
- It is conceptually similar to a ledger in a manual AIS in that:
  - The file is permanent.
  - The file exists across fiscal periods.
  - Changes are made to the file to reflect the effects of new transactions.

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COMPUTER-BASED STORAGE CONCEPTS

- A **transaction file** is a file that contains records of individual transactions (events) that occur during a fiscal period.
- It is conceptually similar to a journal in a manual AIS in that:
  - The files are temporary.
  - The files are usually maintained for one fiscal period.

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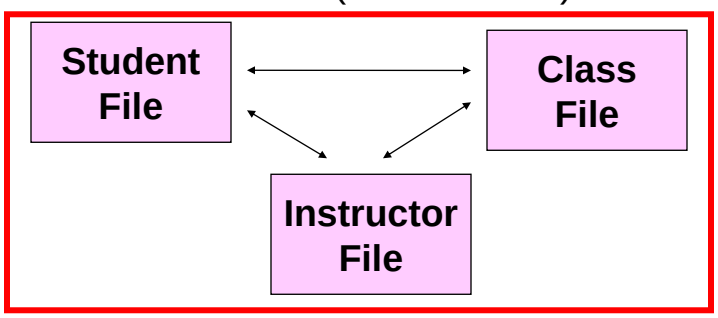
COMPUTER-BASED STORAGE CONCEPTS

- A **database** is a set of interrelated, centrally-coordinated files (tables).
- When files about students are integrated with files about classes and files about instructors, we have a database (relational DB).



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DATA PROCESSING

- After data about a business activity has been collected and entered into a system, it must be processed.

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DATA PROCESSING

- There are four different types of file processing:
  - Updating data to record the occurrence of an event, the resources affected by the event, and the agents who participated, e.g., recording a sale to a customer.
  - Changing data, e.g., a customer address.
  - Adding data, e.g., a new customer.
  - Deleting data, e.g., removing an old customer that has not purchased anything in 5 years.

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DATA PROCESSING--updating

- Updating can be done through several approaches:
  - Batch processing
  - Online batch processing
  - Online, real-time processing
- **If you're going through enrollment, which of these approaches would you prefer that your university was using?**
- **Why?**

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TRANSACTION PROCESSING: THE DATA PROCESSING CYCLE

- The data processing cycle consists of four steps:
  - Data input
  - Data storage
  - Data processing
  - **Information output**

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INFORMATION OUTPUT

- The final step in the information process is information output.
- This output can be in the form of:
  - Documents
  - Reports
  - Queries

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INFORMATION OUTPUT--uses

- Output can serve a variety of purposes:
  - Financial statements can be provided to both external and internal parties.
  - Some outputs are specifically for internal use:
    - For planning purposes
    - For management of day-to-day operations
    - For control purposes
    - For evaluation purposes

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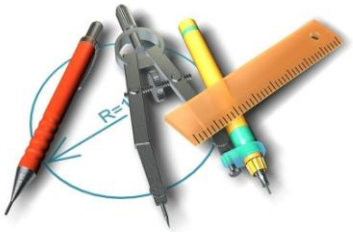
INFORMATION OUTPUT

- Behavioral implications of managerial reports:
  - **YOU GET WHAT YOU MEASURE!**



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INFORMATION OUTPUT

- **Suppose an instructor wants to improve student learning.**
  - **He decides to encourage better attendance by grading students on attendance (i.e., measuring it).**
  - **The result will be better student attendance, i.e., you get what you measure.**
  - **The improved attendance may or may not improve learning outcomes.**
  - **Students may be getting better grades when attendance is measured, but not learning more.**
  - **Some students may in fact reduce their studying because they believe they can use the attendance score to boost their grade. This behavior would be a dysfunctional result of the measurement.**

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INFORMATION OUTPUT

- **Budgets can cause dysfunctional behavior.**
  - **EXAMPLE: In order to stay within budget, the IT department did not buy a security package for its system.**
  - **A hacker broke in and devastated some of their data files.**
  - **Critical security measures were foregone in order to meet budgetary goals.**
  - **The resulting costs far outweighed the savings.**

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ROLE OF THE AIS

- **The traditional AIS captured financial data.**
  - **Non-financial data was captured in other, sometimes-redundant systems**
- **Enterprise resource planning (ERP) systems are designed to integrate all aspects of a company's operations (including both financial and non-financial information) with the traditional functions of an AIS.**

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