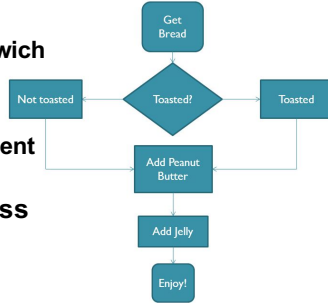


## Chapter 8: Business Processes

- ❖ Process is a series of tasks that are completed in order to accomplish a goal
- ❖ **Business process** is focused on achieving a goal for a business
  - ◆ Subway: Making sandwich
  - ◆ **Supply Chain Management**
  - ◆ UMUC: Receiving student tuition payment
- ❖ Documenting a Process
  - ◆ Verbal Step-by-step
  - ◆ Flowcharts work well



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## DMS = Document Management System

- ❖ **Document Management System** stores and tracks documents
  - ◆ Versions control with change details
  - ◆ Approvals authorization routing
  - ◆ Audit trail Timestamps
  - ◆ Change notification
  - ◆ Keyword indexing
  - ◆ Storage on server
  - ◆ Access Control
  - ◆ Retrieval from server
  - ◆ Capture Image and text
- ❖ Document **Business Processes**



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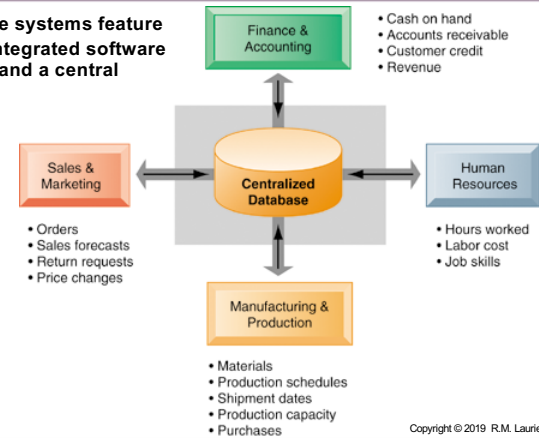
## Enterprise Applications

- ❖ Enterprise Systems
  - ◆ Aka enterprise resource planning (ERP) systems
  - ◆ Suite of **integrated** software modules and a common database
  - ◆ Collects data from many divisions of firm for use in nearly all of firm's internal business activities
  - ◆ Information entered in one process is immediately available for other processes
- ❖ Enterprise software has 1000s of predefined modules reflecting best practices for Business Processes
  - ◆ Finance/accounting: General ledger, accounts payable, etc.
  - ◆ Human resources: Personnel administration, payroll, etc.
  - ◆ Manufacturing/production: Purchasing, shipping, etc.
  - ◆ Sales/marketing: Order processing, billing, sales planning, etc.
- ❖ Firm select modules for implementation
- ❖ Maps business processes to software processes

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## How ERP Systems Work

Enterprise systems feature a set of integrated software modules and a central database



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## Enterprise Resource Planning System

- ❖ **ERP** is a centralized database application
  - ◆ Can be used to run an entire corporate enterprise
  - ◆ Shares information across between all entities
- ❖ Implements the rules of all associated Business Processes
  - ◆ Best for structured processes
  - ◆ Best practices built in!
  - ◆ Existing process replaced
  - ◆ Is ERP process better?
  - ◆ Loss of differentiation
  - ◆ Not well suited for unstructured Business processes

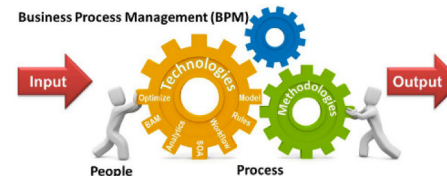


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## Business Value of Enterprise Systems

- ❖ Increase operational efficiency
- ❖ Provide firmwide information to support decision making
- ❖ Enable rapid responses to customer requests for information or products
- ❖ Include analytical tools to evaluate overall organizational performance

Business Process Management (BPM)



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## Business Process Management

- ❖ Intentional effort to plan, document, implement, and distribute an organization's business processes with IT
- ❖ Best processes to manage:
  - ◆ Include employees from multiple departments
  - ◆ Require decisions that cannot be easily automated
  - ◆ Processes that change based on circumstances
- ❖ Key Benefits of **BPM**:
  - ◆ Empowering Employees to make limited decisions
  - ◆ Built-in reporting provides feedback to organization
  - ◆ Enforces Best Practices and Consistency for a process

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## Business Process Reengineering

- ❖ Automating a bad process doesn't improve it
- ❖ Develop new processes that take advantage of new technologies and concepts
- ❖ **BPR** is fully understanding goals of a process and redesigning it to improve productivity and quality
  - ◆ Organize around outcomes, not tasks
  - ◆ Instead of repeating one step in the process over and over, the person stays involved in the process from start to end
  - ◆ When one department of organization creates information it should be processed by that same department
  - ◆ Centralize geographically dispersed resources (IT, HR, Billing)
  - ◆ Link parallel activities instead of integrating their results
  - ◆ Decisions points in workflow and build controls into process
  - ◆ Avoid data redundancy, capture data once, at the source

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### IT's Six Strategic Business Objectives

1. **Operational excellence:**
  - ◆ Improvement of efficiency to improve profitability
  - ◆ *Walmart's RetailLink* links suppliers to stores
2. **New products, services, and business models:**
  - ◆ Enabling tool for new products and services  
Example: Apple's iPod, iTunes, iPhone, iPad
  - ◆ *Business model*: describes how company produces, delivers, and sells to create wealth
3. **Customer and supplier intimacy:**
  - ◆ Serving customers well leads to customers returning, which raises revenues and profits
  - ◆ Example: High-end hotels use computers to track customer preferences and customize environment
  - ◆ Intimacy with suppliers allows them to provide vital inputs  
*Just-In-Time*, which lowers costs

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### IT's Six Strategic Business Objectives

4. **Improved decision making with DSS**
  - ◆ Without accurate information managers must use forecasts, best guesses, luck
    - ◆ Leads to overproduction and underproduction of goods
    - ◆ Poor response times, raise costs, lose customers
5. **Competitive advantage**
  - ◆ Delivering better performance
  - ◆ Charging less for superior products
  - ◆ Rapid response to customers and suppliers
6. **Survival**
  - ◆ Industry-level changes example: ATM's and ACH
  - ◆ Governmental regulations requirements examples
    - ◆ Toxic Substances Control Act – 30 year records
    - ◆ Sarbanes-Oxley Act – 5 year accounting records for audit

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### Information Technology Infrastructure

- ❖ IT Infrastructure consists of the categories
  - ◆ Chapter 2 – Computer Hardware
  - ◆ Chapter 3 – Computer Software
  - ◆ Chapter 5 – Networking and Data Communication



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### Chapter 2 – Computer Hardware

- ❖ Computer hardware encompasses *digital* devices that can be physically touched



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## Digital Device = Binary Processor

- ❖ Digital data is represented and manipulated using the **binary system** = Base 2
- ❖ Each digit in binary is called a **bit**
  - ◆ A bit value can be in one of two states
  - ◆ Represented by 0/1, T/F, On/Off.
- ❖ A group of 8 bits is called a **byte** see below
  - ◆ Decimal number = 74    0 1 0 0 1 0 1 0
  - ◆ ASCII letter = 'J'
  - ◆ Gray Level = 28.9%
- ❖ A group of 16 bits is called **2 bytes** see below
  - ◆ 0011,0000,0100,0010 = 12354 decimal = unicode
  - ◆ 0101,1100,0111,0001 = 23665 decimal = unicode

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## Personal Computers

- ❖ **Personal Computers** support a person
  - ◆ **Desktop computer** = Designed so all of the components fit entirely on or under a desk or table
  - ◆ **Laptop (Notebook) computer** = Portable computer
  - ◆ **Tablet (e-Reader) computer** = iPad, Kindle
  - ◆ **Smart phones** = iPhone, Android



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## Server Computers

- ❖ These computers are shared by many users
  - ◆ Servers control access to network resources and provides centralized storage
  - ◆ Web Servers serve web applications and web pages for World Wide Web using Internet
  - ◆ Mainframe Powerful, expensive computer that supports thousands of connected users
  - ◆ Supercomputer Fastest, most powerful, most expensive computer used for applications requiring complex mathematics

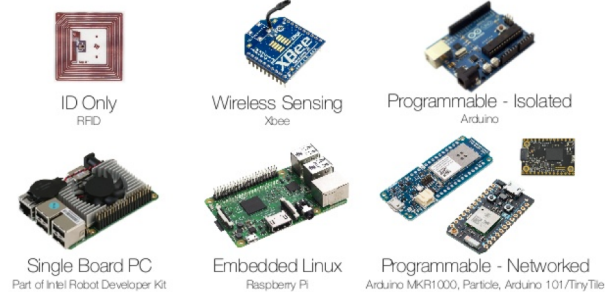


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## Embedded Computers

- ❖ An **embedded computer** is a special-purpose computer that functions as a component in a product

### Embedded Systems Types



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## Memory Size and Speed

- ❖ Storage memory capacity is expressed in the **number of bytes**

|                         |    |                         |
|-------------------------|----|-------------------------|
| ◆ 1 KiloByte = $2^{10}$ | or | 1024 bytes              |
| ◆ 1 MegaByte = $2^{20}$ | or | 1,048,576 bytes         |
| ◆ 1 GigaByte = $2^{30}$ | or | 1,073,741,824 bytes     |
| ◆ 1 TeraByte = $2^{40}$ | or | 1,099,511,627,776 bytes |

- ❖ Bus speeds

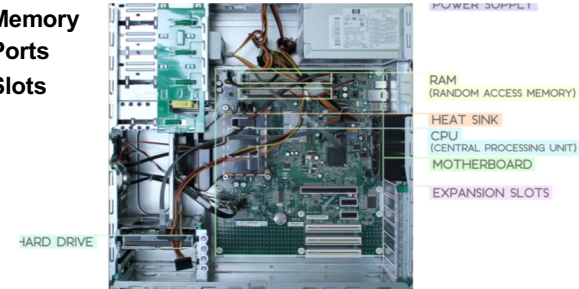
|                        |    |               |
|------------------------|----|---------------|
| ◆ 1 KiloHertz = $10^3$ | or | 1 milliSecond |
| ◆ 1 MegaHertz = $10^6$ | or | 1 microSecond |
| ◆ 1 GigaHertz = $10^9$ | or | 1 nanoSecond  |

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## Inside the Case of a Desktop Computer

- ❖ Motherboard provides electrical interconnects

- ◆ CPU = microprocessor
- ◆ Storage devices: Hard drive, SSD, CD/DVD Drive
- ◆ Memory
- ◆ Ports
- ◆ Slots



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## Central Processor Unit and Memory

- ❖ CPU

- ◆ Register memory (fastest)
- ◆ Data transferred with memory via three buses

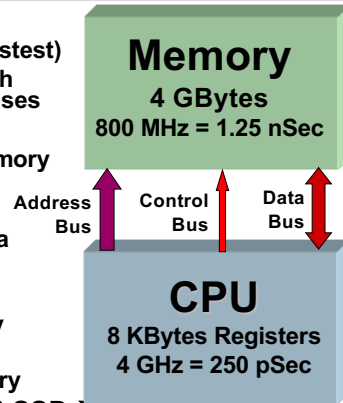
- ❖ RAM Memory

- ◆ Random-access memory
- ◆ **Volatile** memory
- ◆ Stores program instructions and data

- ❖ ROM Memory

- ◆ Read-only memory
- ◆ **Non-volatile** memory
- ◆ Boot program
- ◆ Usually Flash memory

- ❖ Speed CPU → RAM → SSD → HD



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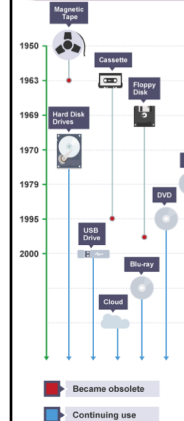
## Storage devices are Non-volatile

- ❖ Storage devices

- ◆ hold data, information and instructions for future use

- ❖ Storage media is physical material used for storage

- ◆ Magnetic: Hard drives, diskettes, credit cards, tapes
- ◆ Optical: removable media
  - ◆ CD, CD-R, CD-RW = 700 MB
  - ◆ DVD = 4.7 GB
  - ◆ Blue Ray Disk = 25 GB
- ◆ Solid State Devices:
  - ◆ USB Drives
  - ◆ SSD Drives
  - ◆ Flash memory



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## Chapter 3 – Software

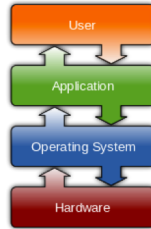
❖ **Software**, tells computer the tasks to perform and defines a sequence to execute the tasks

### ❖ Operating System

- ◆ Delivers hardware resources to user
- ◆ User interface to application software
- ◆ Provides Graphical User Interface
- ◆ Windows, MacOS, Linux, iOS, Android

### ❖ Applications Software

- ◆ Word Processing = Microsoft Word
- ◆ Spreadsheets = Excel
- ◆ Presentation Graphics = PowerPoint
- ◆ Database = Access
- ◆ Office Suites: Microsoft Office, LibreOffice
- ◆ Cloud based software: Google docs, zoho.com



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## Functions of an Operating System

### ❖ Interfacing with Users

- ◆ Booting the Computer
- ◆ Loads essential part of OS into memory

### ❖ Determines hardware connected

- ◆ Configures peripheral devices
- ◆ Device driver software for hardware communication
- ◆ Plug and Play devices are recognized by OS

### ❖ Provides a platform to write applications

### ❖ Managing Network Connections

- ◆ Manages wired connections to network
- ◆ Manages wireless connections Wifi, 3G, etc.

### ❖ File Management - Windows Explorer, MacOS finder

- ◆ Files usually viewed in hierarchical folder (directory) structure

### ❖ Security: Passwords and Firewalls



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## Unix and Linux

### ❖ UNIX: AT&T and Sun Microsystems

- ◆ Intended for workstations and servers

### ❖ Linux

- ◆ Developed by Linus Torvalds in 1991 grad project
- ◆ Open-source software: usually free without support
- ◆ <http://distrowatch.com/>
- ◆ My favorites are: Zorin, Ubuntu Mate, Mint
- ◆ Very powerful with bash scripting

### ❖ Strong support from mainstream companies

- ◆ Google, Oracle, IBM, HP, and Novell
- ◆ Android OS is a derivative of Linux
- ◆ MacOS is a derivative of UNIX

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## Utility Programs

### ❖ Software that is usually related to managing or maintaining the computer

#### ◆ Many utilities are built into operating systems

- ◆ Control Panel accesses common utilities
- ◆ File management program = Windows Explorer
- ◆ Search Tools = integrated into Windows Explorer
- ◆ Diagnostic and Disk Management Programs
- ◆ Uninstall and Cleanup Utilities
- ◆ File compression programs = Windows Explorer or 7-zip
- ◆ Backup and Recovery Utilities

#### ◆ Can be stand-alone products

- ◆ Antivirus Scanner = BitDefender, AVG and Avast
- ◆ Spyware Scanner = Spybot Search and Destroy

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## Application Software

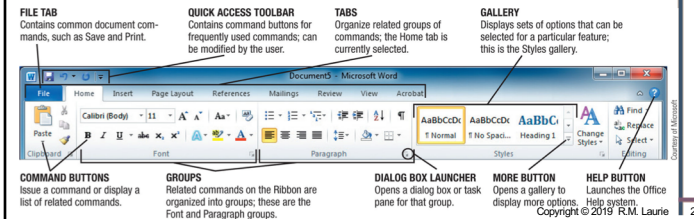
### ❖ How is software distributed?

- ◆ **Commercial software**, mass-produced for purchase
  - ◆ Microsoft Office
- ◆ **Custom software**, performs functions specific to a business or industry
- ◆ **Web app software**, hosted by a Web site
  - ◆ Google Drive, Zoho, and Microsoft Office 365
- ◆ **Open source software**, provided for use, modification, and redistribution
  - ◆ [www.OpenOffice.org](http://www.OpenOffice.org) [www.LibreOffice.org](http://www.LibreOffice.org)
- ◆ **Shareware**, copyrighted software that is distributed free for trial period
- ◆ **Freeware**, copyrighted software provided at no cost
- ◆ **Public-domain software**, freeware with no copyright restrictions

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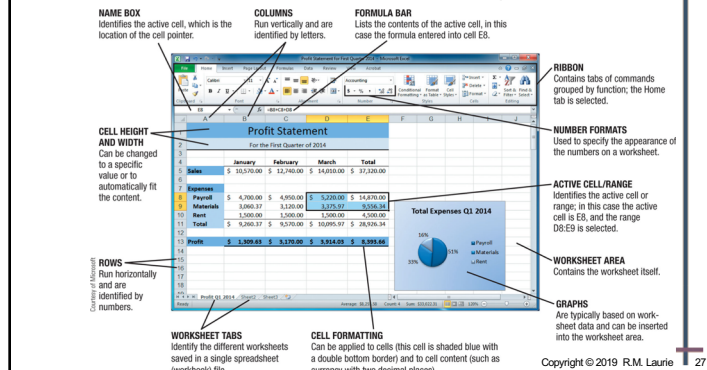
## Office Suite Software

- ❖ Programs designed to make users more productive and assist them with tasks
- ❖ **Microsoft Office = packaged software**
  - ◆ Core applications: Word, Excel, PowerPoint, Access
  - ◆ Personal Information Manager – Outlook



## Spreadsheet

- ❖ **Spreadsheet software** allows users to organize data, perform calculations, and **chart** data as graphic



## Applications for the Enterprise

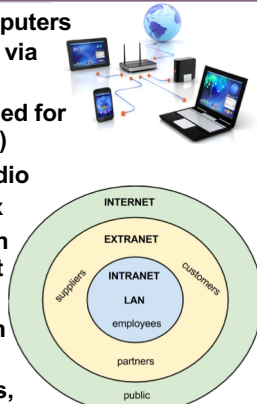
- ❖ **Enterprise Resource Planning (ERP)**
  - ◆ ERP is software applications that utilize a central database for the entire organization
  - ◆ Enforce best practices
  - ◆ Supply Chain Management (SCM) module included
  - ◆ Can take 2 – 3 years to implement and lots of \$\$\$
- ❖ **Supply Chain Management (SCM)**
  - ◆ Inventory control, supplier links, distributor links
- ❖ **Customer Relations Management (CRM)**
  - ◆ Create relationships with customers
  - ◆ Salesforce is the current leader
  - ◆ UMUC chose Salesforce



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## Chapter 5 – Networking

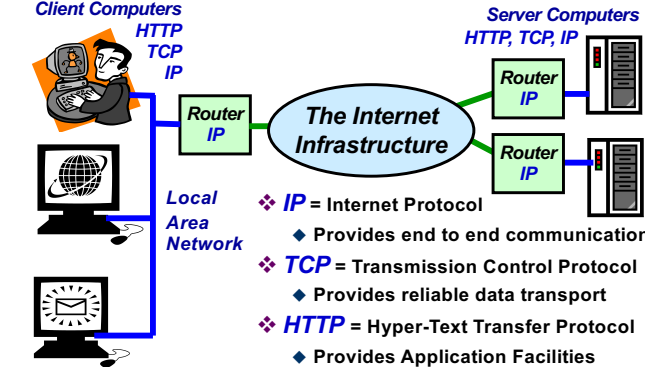
- ❖ A **Network** is a collection of computers and devices connected together via transmission media
- ❖ **Ethernet** is standard protocol used for LAN=Local Area Network (Wired)
- ❖ **Wi-Fi** is a wireless LAN using radio
- ❖ Mobile Networks: **3G, 4G, WiMax**
- ❖ **Internet** is a worldwide collection of interconnecting networks that connects millions of worldwide
- ❖ **Intranet** is only accessible within corporate networks
- ❖ **Extranet** connects with suppliers, partners, and customers



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## TCP/IP Internetworking Protocols

Client contacts server specified by **URL =Uniform Resource Locator**



How the Internet Works = [http://youtu.be/7\\_LPdtKXPc](http://youtu.be/7_LPdtKXPc)

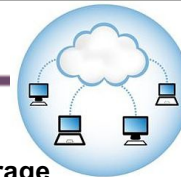
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## Accessing the World Wide Web

- ❖ The World Wide Web utilizes the Internet
  - ❖ **HTTP** (Hyper Text Transfer Protocol) accesses web sites files located on the web server
  - ❖ Each web site has **URL (Uniform Resource Locator)**
    - ◆ <http://www.islandman.org> ◆ .edu (education)
    - ◆ <http://www.umuc.edu> ◆ .com (commercial)
    - ◆ <http://mail.yahoo.com> ◆ .gov (government)
    - ◆ ◆ .org (non-profit)
- http://www.umuc.edu/cs/courses/index.html**
- |          |        |        |     |             |      |
|----------|--------|--------|-----|-------------|------|
| Protocol | Server | Domain | TLD | Folder Path | File |
|----------|--------|--------|-----|-------------|------|
- ❖ **Domain Name Server** matches URL with **IP address**
    - ◆ [www.nmcnet.edu](http://www.nmcnet.edu) → 12.178.198.111 (Octet <= 255)
    - ◆ [www.whois.ws](http://www.whois.ws) → 69.25.212.161

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## Cloud Storage



- ❖ Cloud storage refers to the creation and use of remote servers over Internet for data storage
- ❖ Can share files across multiple Devices
  - ◆ Free Services: **Dropbox, Google Drive, iCloud,**
  - ◆ Microsoft OneDrive, **SpiderOak (secure), iDrive**
  - ◆ Advantage: Good for data backup and file sharing
  - ◆ Disadvantages: Requires Internet and security risk
- ❖ **SAAS = Software As A Service**
  - ◆ Utilizes browser for UI user interface
  - ◆ Utilizes cloud storage for storing files
  - ◆ Office SAAS: Zoho, Google Docs, and Office 365

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