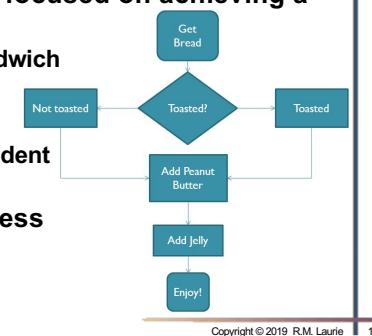


Chapter 8: Business Processes

- ❖ 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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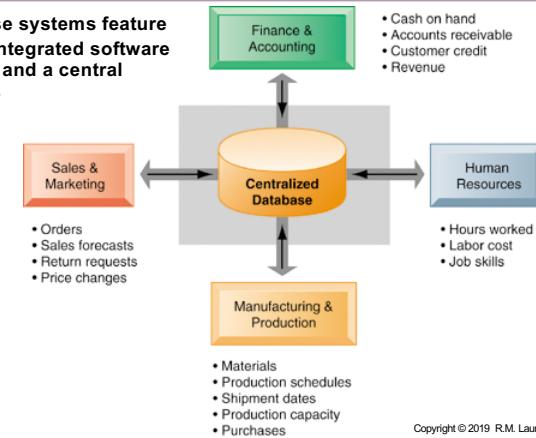
Enterprise Applications

- ❖ 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

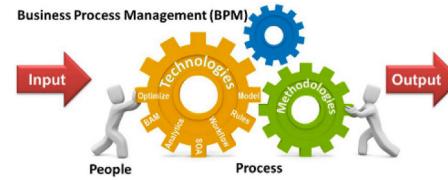
- ❖ **ERP** is a centralized database application
 - ◆ Can be used to run an entire corporate enterprise
 - ◆ Shares information across between all entities
- ❖ Implements the rules of all associated Business Processes
 - ◆ Best for structured processes
 - ◆ Best practices built in!
 - ◆ Existing process 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



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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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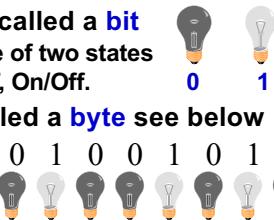
Chapter 2 – Computer Hardware

- ❖ 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 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

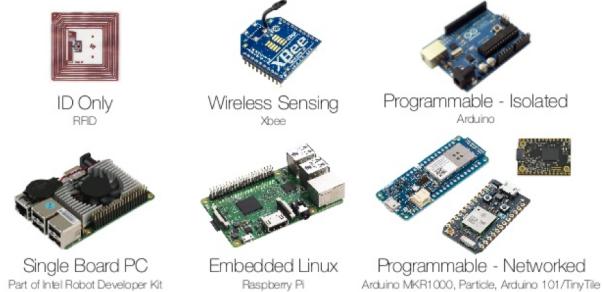


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Embedded Computers

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

Embedded Systems Types



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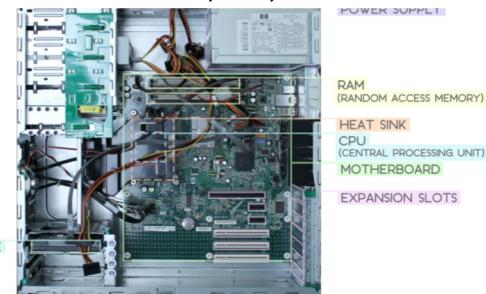
Memory Size and Speed

- ❖ Storage memory capacity is expressed in the **number of bytes**
 - ◆ $1 \text{ KiloByte} = 2^{10}$ or 1024 bytes
 - ◆ $1 \text{ MegaByte} = 2^{20}$ or 1,048,576 bytes
 - ◆ $1 \text{ GigaByte} = 2^{30}$ or 1,073,741,824 bytes
 - ◆ $1 \text{ TeraByte} = 2^{40}$ or 1,099,511,627,776 bytes
- ❖ Bus speeds
 - ◆ $1 \text{ KiloHertz} = 10^3$ or 1 milliSecond
 - ◆ $1 \text{ MegaHertz} = 10^6$ or 1 microSecond
 - ◆ $1 \text{ GigaHertz} = 10^9$ or 1 nanoSecond

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Inside the Case of a Desktop Computer

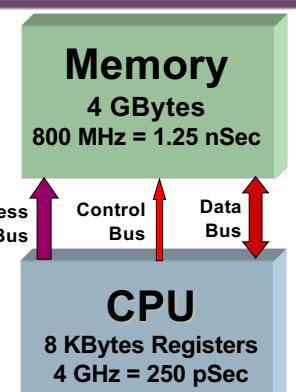
- ❖ Motherboard provides electrical interconnects
 - ◆ CPU = microprocessor
 - ◆ Storage devices: Hard drive, SSD, CD/DVD Drive
 - ◆ Memory
 - ◆ Ports
 - ◆ Slots



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Central Processor Unit and Memory

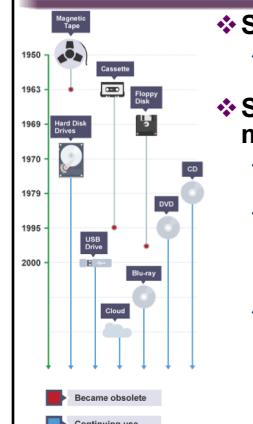
- ❖ **CPU**
 - ◆ Register memory (fastest)
 - ◆ Data transferred with memory via three buses
- ❖ **RAM Memory**
 - ◆ Random-access memory
 - ◆ **Volatile** memory
 - ◆ Stores program instructions and data
- ❖ **ROM Memory**
 - ◆ Read-only memory
 - ◆ **Non-volatile** memory
 - ◆ Boot program
 - ◆ Usually 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

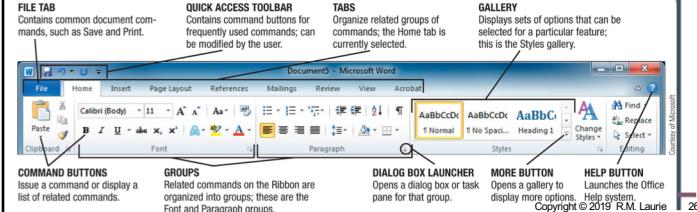
❖ How is software distributed?

- ◆ **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 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

Office Suite Software

❖ Programs designed to make users more productive and assist them with tasks

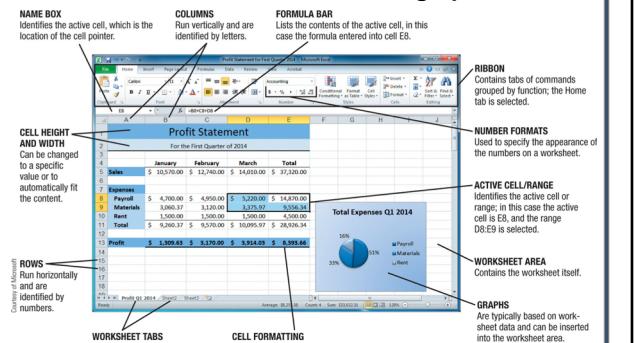
- ❖ **Microsoft Office** = packaged software
 - ◆ Core applications: Word, Excel, PowerPoint, Access
 - ◆ Personal Information Manager – Outlook



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Spreadsheet

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



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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)

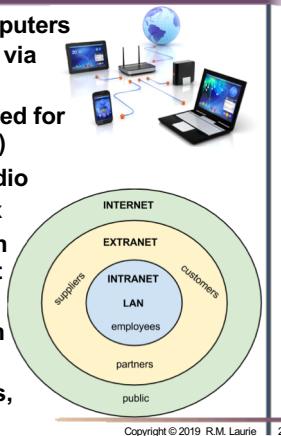
- ◆ Create relationships with customers
- ◆ Salesforce is the current leader
- ◆ UMUC chose Salesforce



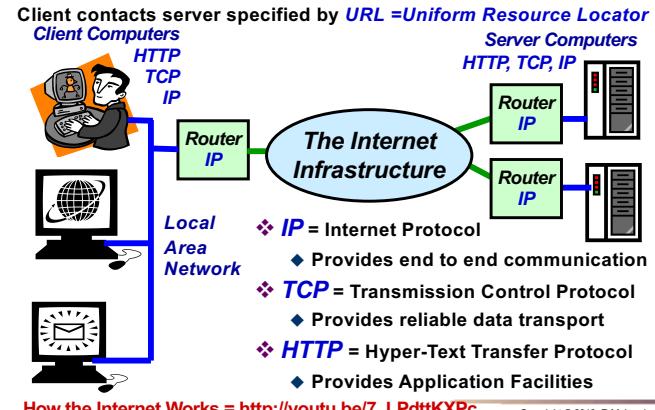
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Chapter 5 – Networking

- ❖ 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



TCP/IP Internetworking Protocols



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)
 - ◆ <http://www.umuc.edu/cs/courses/index.html> .org (non-profit)
- ❖ Domain Name Server matches URL with **IP address**
 - ◆ www.nmcnet.edu → 12.178.198.111 (Octet <= 255)
 - ◆ www.whois.ws → 69.25.212.161

Protocol Server Domain TLD Folder Path File

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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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