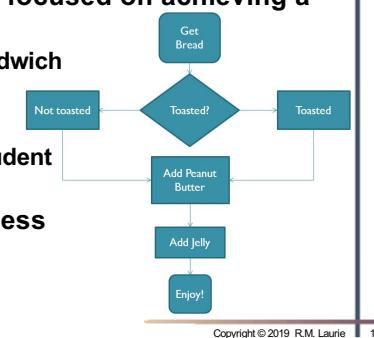


Chapter 8: Business Processes

- ❖ 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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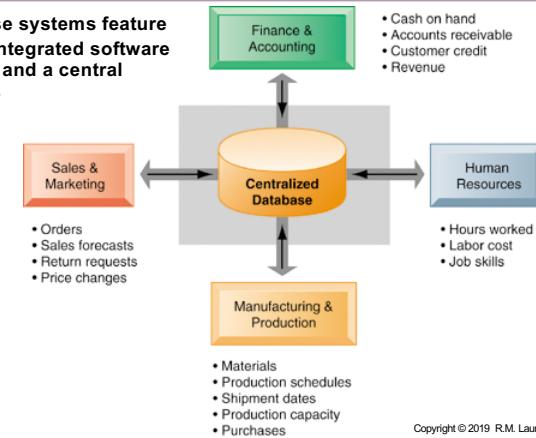
Enterprise Applications

- ❖ 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

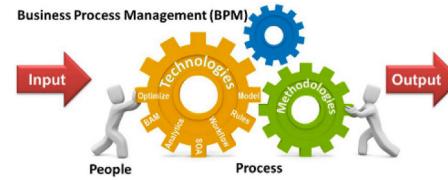
- ❖ **ERP** is a centralized database application
 - ◆ Can be used to run an entire corporate enterprise
 - ◆ Shares information across between all entities
- ❖ Implements the rules of all associated Business Processes
 - ◆ Best for structured processes
 - ◆ Best practices built in!
 - ◆ Existing process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

- ❖ ISO 9000 and 9001 defines quality standards
 - ◆ Corporate certification describes that they are managing business processes in an effective way
- ❖ Dr Demming TQM 1 2 3 in Japan 1970's in USA 1980's
 - ◆ Deming's concepts based on statistical process control
 - ◆ Deming's Seven Deadly Diseases of Management
 1. Lack of constancy of purpose
 2. Management by use only of data, with little consideration of data that are unknown or unknowable
 3. Evaluation of performance, merit rating, or annual review
 4. Emphasis on short-term profits
 5. Mobility of management; job hopping
 6. Excessive costs of liability
 7. Excessive medical costs
 - ◆ Deming's 14 Points for Management



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Videos to View

1. Supply Chain? <https://youtu.be/Mi1QBxVjZAw>
2. Business Processes <https://youtu.be/JUlnjQvzlxE>
3. Document MS <https://youtu.be/-1udkX8VCTc>
4. ERP <https://youtu.be/6qys-562kp4>
5. BPM <https://youtu.be/iI6T3-7JxdU>
6. BPR <https://youtu.be/ee8iGNfem50>
7. Demming - Part 1 <https://youtu.be/GHvnIm9UEoQ>
8. Demming - Part 2 <https://youtu.be/mKFGj8sK5R8>
9. Demming - Part 3 <https://youtu.be/6WeTaLRb-Bs>
10. <https://deming.org/explore/seven-deadly-diseases>
11. <https://deming.org/explore/fourteen-points>

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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
 - ◆ ASCII letter = 'J'
 - ◆ Gray Level = 28.9%
- ❖ A group of 16 bits is called **2 bytes** see below
 - ◆ 0011,0000,0100,0010 = 12354 decimal = も unicode
 - ◆ 0101,1100,0111,0001 = 23665 decimal = 山 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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Input and Output Peripheral Devices

- ❖ Computer's perspective determines whether Input (data) or Output (information) devices
 - ◆ **Input devices:** keyboard, mouse, microphone, camera, scanner, joystick, remote control
 - ◆ **Output devices:** display monitor, printer, speakers
- ❖ Touch screens
 - ◆ Provide both input and output
- ❖ Ports connect peripherals
 - ◆ USB 2 or 3 Ports
 - ◆ HDMI ports for Video
 - ◆ Bluetooth is actually a wireless radio signal port

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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

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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

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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

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TCP/IP Internetworking Protocols

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

Client Computers: HTTP, TCP, IP

Server Computers: HTTP, TCP, IP

The Internet Infrastructure

Router IP

Local Area Network

IP = Internet Protocol

- ◆ Provides end to end communication

TCP = Transmission Control Protocol

- ◆ Provides reliable data transport

HTTP = Hyper-Text Transfer Protocol

- ◆ Provides Application Facilities

How the Internet Works = http://youtu.be/7_LPdttKXPc

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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)
 - ◆ <http://www.whois.ws> .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 → 12.178.198.111 (Octet <= 255)
 - ◆ 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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