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

Documenting a Process

- **Verbal Step-by-step**
- **Flowcharts**
  - **Document Management System (DMS)** stores and tracks documents
    - Versions control with change details
    - Approvals/authorization routing
    - Audit trail Timestamps
    - Key index/Keyword indexing
    - Storage on server
    - Access Control
    - Retrieval from server
    - Capture Image and text
- **Document Management System (DMS)**

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

How ERP Systems Work

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

- **Finance & Accounting**
  - Cash on hand
  - Accounts receivable
  - Customer credit
  - Revenue
- **Manufacturing & Production**
  - Orders
  - Sales forecasts
  - Return requests
  - Price changes
- **Human Resources**
  - Hours worked
  - Labor cost
  - Job skills

DMS = Document Management System

- **Document Management System (DMS)**
  - **DMS**
  - **Capture**
  - **Storage**
  - **Retrieval**
  - **Indexing**
  - **Locating**
  - **Auditing**
  - **Audit**
  - **Timestamps**
  - **Keywords**
  - **Indexing**
  - **Access Control**
  - **Retrieval from server**
  - **Image and text capture**

Copyright © 2019  R.M. Laurie
**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

**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**
- 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

**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
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

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

Information Technology Infrastructure

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

Chapter 2 – Computer Hardware

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

Copyright © 2019  R.M. Laurie
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 = あ unicode
  - 0101,1100,0111,0001 = 23665 decimal = 山 unicode

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

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

Embedded Computers

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

Embedded Systems Types

- ID Only
- Wireless Sensing
- Programmable - Isolated
- Single Board PC
- Embedded Linux
- Programmable - Networked
- Arduino

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

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

Inside the Case of a Desktop Computer

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

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
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

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

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/](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
  - MacOS OS is a derivative of Linux
  - MacOS is a derivative of UNIX

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
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

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
Chapter 5 – Networking

- A **Network** is a collection of computers and devices connected together via transmission media.
- **Ethernet** is the 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

- **IP** = Internet Protocol
  - Provides end to end communication.
- **TCP** = Transmission Control Protocol
  - Provides reliable data transport.
- **HTTP** = Hyper-Text Transfer Protocol
  - Provides Application Facilities.

---

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 a **URL** (Uniform Resource Locator).
  - http://www.islandman.org
  - http://www.umuc.edu
  - http://mail.yahoo.com
  - http://www.umuc.edu/cs/courses/index.html

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.