Chapter 12: Enterprise Computing

What is Enterprise Computing?

First, a few definitions…

- **Enterprise**: a business, or more specifically, a multinational corporation, university, hospital, research lab, or gov't organization
- **Enterprise computing**: the use of computers in networks to meet diverse business computing needs
- **Functional units**: the corporate headquarters, remote offices, int'l offices and individual operating entities that make up an enterprise

Types of Enterprises

- Retail (i.e. Target)
- Manufacturing (i.e. Boeing)
- Service (i.e. Wells Fargo Bank)
- Wholesale (i.e. Whole Blossoms Flowers)
- Government (i.e. US Postal Service)
- Educational (i.e. UC Berkeley)
- Transportation (i.e. Southwest Airlines)

Organizational Structure of an Enterprise

- President/Chief Executive Officer (CEO)
  - Chief Operating Officer (COO)
    - Vice Presidents of Functional Units including HR, Engineering/Product Development, Manufacturing, Marketing, Sales, Distribution, and Customer Service
  - Chief Information Officer (CIO)
    - Vice President of Information Technology
  - Chief Financial Officer (CFO)
    - Vice President of Accounting and Finance

Organizational Structure of an Enterprise

- **Core activities**: activities that relate to the company's main mission
- **Supporting activities**: activities that relate to running a company
- **Operations**: refers to the core activities of a company, and involves creating, selling, and supporting the company's products and services
- **Centralized vs. decentralized approach to information technology**: whether or not departments/divisions maintain their own information systems

Levels of Users in an Enterprise

- Executive management
  - Focuses on long-range direction of company; responsible for making strategic decisions that are in line with the company's overall goals/objectives
- Middle management
  - Responsible for carrying out strategic decisions and making tactical (short-range) decisions
- Operational management
  - Supervises production, clerical and other non-management employees; makes operational decisions
- Non-management employees
  - Assigned various on-the-job type decisions

What do Managers do with Information?

Enterprise information: any information gathered in the ongoing operations of an enterprise

Managers coordinate and control resources (such as money, people, materials, and data) by using information to:

- Plan
- Organize
- Lead
- Control

Information Systems

- **Information system**: a set of hardware, software, data, people, and procedures that work together to produce information
  - Supports daily, short-term, and long-term activities of users within an enterprise
- Types of information systems: Information systems within functional units, general purpose information systems, and integrated information systems

Information Systems within Functional Units

- Accounting and Finance
  - Microsoft Dynamics GP; Oracle Financials; NetSuite
- Human Resources
  - Lawson Human Capital Management; Oracle PeopleSoft Enterprise Human Capital Management; Sage ABRA HRMS
- Engineering or Product Development
  - AutoCAD; MicroStation; ProductVision
- Manufacturing
  - CA=Plus MISys Manufacturing System; Horizon Software MRP Plus; Plexus Online
- Marketing
  - Aprimo Enterprise; Oracle Marketing; Marketing Pilot

Information Systems within Functional Units

- Sales
  - OpenBOX Sales Force Automation; Prophet Professional; SalesForce SFA
- Distribution
  - Activant Prophet 21; IBS's Advanced Inventory & Distribution Sofware; Oracle Transportation Management
- Customer Service
  - SAP CRM; Siebel CRM On Demand; Syntellect Customer Interaction Management Suite
- Information Technology
  - Microsoft System Center Configuration Manager; VMware vCloud

General Purpose Information Systems

- Five categories:
  - Office Information Systems: enables employees to perform tasks using computers instead of manually
  - Transaction Processing Systems: captures and processes data from day-to-day business activities
  - Management Information Systems: generates accurate, timely, and organized info so that managers can make well-informed decisions
  - Decision Support Systems: helps users analyze information and make decisions
  - Expert Systems: captures an stores the knowledge of human experts and then imitates human reasoning and decision making

Integrated Information Systems

- **Integrated Information Systems**: an information system that combines one or more of the general types of information systems
- Three types:
  - Customer Relationship Management
  - Enterprise Resource Planning
  - Content Management Systems

Common Enterprise-Wide Technologies

- **Portal**: a collection of links, content, and services presented on a Web page and meant to guide users to info they are likely to find interesting and/or useful
- **Data warehouse**: a huge database that stores and manages data required to analyze historical and current transactions
- **Electronic data interchange**: a set of standards that controls the transfer of business data and info among computers both within and among enterprises
- **Extranet**: the portion of a company's network that allows customers or suppliers to access parts of an enterprise's intranet

Common Enterprise-Wide Technologies

- **Document management systems**: allows for storage and management of a company's documents
- **Workflow**: a defined process that identifies the specific set of steps involved in completing a particular project or process
- **Virtual private networks**: a secure connection to a company's network server from a user's computer

Virtualization

- **Virtualization**: the practice of sharing or pooling computing resources, such as servers and storage devices
- **Server virtualization**: the capability to divide a physical server logically into many virtual servers

Cloud and Grid Computing

- Outside computing resources can be more economical than adding new resources internally
  - Provides increased flexibility and capability
- **Cloud computing**: an Internet service that provides computing needs to users
  - A pay-as-you-go type of service
- **Grid computing**: combines many servers and/or personal computers on a network to act as one large computer
  - Also a pay-as-you-go type of service

Enterprise Hardware

- Permits large enterprises to store and manage information and data using devices made for heavy use and maximum availability & efficiency
- **RAID** (Redundant Array of Independent Disks): a group of two or more integrated hard disks
  - Duplicates data, instructions, and info to improve reliability
- **NAS** (Network attached storage): a server that is placed on a network with the sole purpose of providing storage to users and information systems attached to the network; also known as a *storage appliance*

Enterprise Hardware

- **SAN** (Storage area network): a high-speed network with the sole purpose of providing storage to other servers to which it is attached
- **Enterprise storage system**: focuses on the availability, protection, organization, and backup storage in a company
- **Blade server**: aka an ultradense server, packs a complete computer server on a single card (blade) rather than on a system unit
- **Thin client**: a small, terminal-like computer that relies on a server for data storage and processing

High-Availability Systems

- **High-availability system**: a system that continues running and performing tasks at least 99% of the time
- "Uptime" refers to a system's availability
- "Downtime" refers to any time that the system is nonfunctional, such as when a computer crashes, needs repairs, or requires installation

High-Availability Systems

- Some enterprises demand particularly high levels of availability due to the nature of their business (i.e. 911 call centers)
- **Hot-swapping**: permits certain components to be replaced while the rest of the system keeps running
- **Redundant components**: permits a functioning component to automatically take over the tasks of a similar component that fails

Scalability

- **Scalability**: a measure of how well computer hardware, software, or an information system can grow to meet increasing performance demands
- As an enterprise grows, the information systems must grow with it or be replaced
  - Adding hardware is usually the simplest solution but may not be practical given software constraints

Interoperability

- **Interoperability**: the ability of an information system to share information with other information systems in an enterprise
- "Open": information systems that easily share information
- "Closed" or "Proprietary": information systems that are difficult to interoperate

Backup Procedures

- There are five types of backup that can be used by businesses and home users:
  - Full: copies all computer files
    - Pro: provides best protection; Con: time-consuming
  - Differential: copies only files that have changed since the last full backup
  - Incremental: copies only files that have changed since last full or differential backup
  - Selective: user chooses which files to back up, regardless of whether they have changed

Backup Procedures

- Continuous data protection (only used by large enterprises): all data is backed up whenever a change is made
  - Pros: high level of security, requires little maintenance; Con: very costly
- Every company should have their backup procedures clearly documented in writing and the procedures should be followed carefully and consistently
- Home users should perform full backups at regular intervals, such as once per week

Should a disaster strike…

An enterprise should have the following plans in place in the event of a disaster:

- **Disaster Recovery Plan**: a written plan detailing steps a company would take to restore computer operations
- **Emergency Plan**: details the steps to be taken immediately after a disaster occurs
- **Backup Plan**: specifies how to use backup files and equipment to resume information processing
- **Recovery Plan**: details the actions to be taken to restore full information processing operations
- **Test Plan**: involves simulating various types of disasters and evaluating a company's ability to recover

The End

Any questions?