Enterprise Systems

- ISs that integrate key business processes (value chain activities) of a firm into a single software system.
  - Usually replaces several transaction processing systems
  - Are based on a suite of integrated software modules and a common central database usually accessed over a network

- Three main types:
  1) Enterprise Resource Planning (ERP),
  2) Customer Relations Management (CRM), and
  3) Supply Chain Management (SCM) systems
Primary Value Chain Activities and Enterprise Systems

Flow of Information and/or Materials


How Enterprise Systems Work

ERP Example

Centralized Database

- Orders
- Sales forecasts
- Return requests
- Price changes

Sales & Marketing

- Materials
- Production schedules
- Shipment dates
- Production capacity

Manufacturing & Production

Finance & Accounting
- Cash on hand
- Accounts receivable
- Customer credit
- Revenue

Human Resources
- Hours worked
- Labor cost
- Job skills
Benefits of Enterprise Systems

Increases business process efficiencies firm-wide

- Automation often part of implementation
- Standardized processes across functional areas

Real-time cross-functional information availability

- Allows for quicker response to customers
- Improves operational monitoring information flows to workers and managers
- Reduces internal/external value chain delays and inventories by improving coordination of activities and speed of sales/inventory information flows.

The Supply Chain

- A network of organizations and business processes for procuring resources, transforming these resources into intermediate and finished products or services, and distributing the finished products to customers
- Is composed of indirect suppliers, suppliers, production, distributors, retailers, customers
Nike’s Supply Chain

Supply Chain Management Systems

- Provide more information and quicker information about sales, inventory levels and shipping (material flows) at all links of the supply chain.
  - Allow more efficient/effective response to changing customer demand
    - Increase sales through reduced stock outs and lost customers
  - Implementation of JIT Inventory and Reduced Bullwhip
    - Reduce costs. Majority of costs in some manufacturing industries
  - Improved supplier/distributor relations, increased switching costs, increased loyalty?
Bullwhip Effect and JIT

1. Planning (Forecasting Demand up the chain)
2. Execution (Coordination of flow, logistics)
   • The internet has provided a relatively inexpensive platform for both!
Inside the firm? or Outside the firm?

- **Intranets:** Firm’s internal networked business systems – behind the firewall but possibly around the world.
- **Extranets:** Links to firm partners of their business systems. Required for SCM and some CRM (if external distributors/service agents).

Class Activity

- What parts of shoes does Nike produce?
- How does Nike produce value?
Customer Relationship Management Systems

- Systems that capture and integrate customer data from all over the organization, analyze the data, and then distribute information to various systems and customer touch points across the enterprise.
  - Touch point – any method of interaction with the customer

- Three main parts
  - Sales force automation (SFA)
  - Customer service
  - Marketing

Customer Relationship Management (CRM) Integrating “touch points”

- Sales
  - Telephone sales
  - Web sales
  - Retail store sales
  - Field sales

- Service
  - Call center data
  - Web self-service data
  - Wireless data

- Marketing
  - Campaign data
  - Content
  - Data analysis
Customer Relationship Management Systems

- Two types: Operational and analytical CRM
- Integrated data over time allows for Customer Lifetime Value (CLTV) analysis/modeling
- Decreased marketing and sales costs due to increased efficiency and reduced waste
- Increased sales
- Decreased “Churn” rate
- Increased customer involvement/loyalty?

Enterprise Applications: New Opportunities and Challenges

Challenges
- Costly and time consuming for multiple organizations (CRM and SCM)
- Sometimes fail to deliver benefits
- Impose difficult organizational change
- Switching costs are increased!

Opportunities exist to extend enterprise software via web-enabled “Service Platforms”
Class Activity

- Describe an interaction with a customer service agent (computer or human) that left you feeling frustrated.
- What were the roles of data, information and knowledge in this interaction (if any)?
- What decision making was bad from your perspective (if any)?
- What information systems could have helped these bad decisions (if any)?

Software: Computer programs that run computer hardware

Two main types:
1. System Software are programs that run computers and their peripheral hardware.
   - i.e. Linux, Microsoft Windows, etc.
2. Application Software runs on top of System Software to provide specific capabilities/services to the user.
   - i.e accounting, word processing, email, etc.

Other major types (really application software) include:
- DBMS's and Web Services (called middleware)
- Network control/access software
Open Source Software (OSS) is Free

- The programming code for OSS is “freely” or openly shared
- Most OSS can be downloaded for free over the Internet
- Development is often managed by non-profit associations using a peer-review system
- To keep standards unified, hardware and software firms back the associations, i.e., Oracle backs the Linux Foundation
- Vendors make money on OSS by selling support and consulting services

Turn on the LAMP—It’s Free!

- **LAMP**: An acronym standing for
  - Linux,
  - the Apache Web server software,
  - the MySQL database,
  - and any of several programming languages that start with P (Example: Perl, Python, or PHP)
- LAMP software powers many of the sites you visit each day, from Facebook to YouTube
Why Open Source?

- Reasons why firms choose open source products over commercial alternatives:
  - Cost
  - Reliability
  - Security
  - Scalability
  - Agility and time to market

Why Give it Away? The Business of Open Source

- To keep standards unified, several Linux-supporting hardware and software firms back the Linux Foundation
- Hardware firms find their technical talent can be deployed in other value-added services like:
  - Developing commercial software add-ons
  - Offering consulting services
  - Enhancing hardware offerings
Legal Risks and Open Source Software: A Hidden and Complex Challenge

- OSS has several drawbacks and challenges that limit its appeal
  - Complexity of some products
  - Higher total cost of ownership for some products
  - Concern about the ability of a product’s development community to provide support or product improvement
  - Legal and licensing concerns

Cloud Computing and SaaS

- **Cloud computing**: Replacing computing resources (either an organization’s or individual’s hardware or software) with services provided over the Internet
  - **Outsourcing** ISs over the web
  - **Software as a service (SaaS)**: A form of cloud computing where a firm subscribes to a third-party software and receives a service that is delivered online
  - Other cloud computing models that are often referred to as utility computing, platform as a service, or infrastructure as a service
The Software Cloud: Why Buy When You Can Rent?

- SaaS firms offer their clients several benefits
  - Lower costs
  - Financial risk mitigation
  - Faster deployment times
  - Variable operating expense
  - Scalable systems
  - Higher quality and service levels
  - Remote access and availability

SaaS: Not without Risks

- The risks associated with SaaS
  - Dependence on a single vendor
  - Concern about the long-term viability of partner firms
  - Users may be forced to migrate to new versions, possibly incurring unforeseen training costs and shifts in operating procedures
  - Reliance on a network connection — which may be slower, less stable, and less secure
  - Data asset stored off-site — with the potential for security and legal concerns
SaaS: Not without Risks

- Limited configuration, customization, and system integration options are compared to packaged software or alternatives developed in-house
- The user interface of Web-based software is often less sophisticated and lacks the richness of most desktop alternatives
- Ease of adoption may lead to pockets of unauthorized IT being used throughout an organization

Network Security

- Business establishments are increasingly under risk of information security threats
- The TJX example
  - Network in TJX retail store was infiltrated via an insecure Wi-Fi base station
  - 45.7 million credit and debit card numbers were stolen
  - Driver’s licenses and other private information pilfered from 450,000 customers
  - TJX suffered under settlement costs and court-imposed punitive action to the tune of $150 million
Contemporary Security Challenges and Vulnerabilities

The architecture of a Web-based application typically includes a Web client, a server, and corporate information systems linked to databases. Each of these components presents security challenges and vulnerabilities. **Floods, fires, power failures, and other electrical problems can cause disruptions at any point in the network.**

Has anybody been Infected or Phished lately?

- **Phishing:** a fraudulent phone or email message requesting personal/financial information
  - Never provide personal info in response to an email request or link. Go to the corporate site directly from a different browser logon and verify.
  - Don’t be greedy! If it sounds too good to be true, it IS too good to be true and likely fraud.
- **Viruses/Trojan Horses/ Malware:** malicious software often attached to a phishing message or link that takes over your computer.
Taking Action as an Organization

- Firms may face legal or professionally binding compliance requirements
  - HIPAA/Finance Requirements
  - Business Partner Data Sharing Agreements
- Information security should start with **IS auditing and risk assessment**
  - Don’t underestimate the operational, financial, legal and market risks
- **Set IS Security Policy, Educate and Enforce**

Network Security Technology

- **PASSWORDS and Secure Logons**
  - Requiring password changes regularly
  - Requiring password complexity
- **Firewalls**: software that controls network traffic, blocks unauthorized traffic and permits acceptable use
  - Blacklists deny the entry or exit of specific IP addresses and other entities
  - Whitelists permit communication only with approved entities or in an approved manner
- **Intrusion detection systems** monitor unauthorized hacking attempts and take preventive action
Other Technology

- **Patches**
  - Pay attention to security bulletins and install software updates that plug existing holes
  - Patches can unfavorably affect a firm’s systems so need to be tested
- **Lock down hardware**
  - Reimage hard drives of end-user PCs
    - Take away user administration rights?
  - Disable boot capability of removable media
  - Prevent Wi-Fi use
  - Require VPN encryption for network transmissions

Understanding Vulnerabilities: Insiders & Social Engineering

- A wide **majority** of security threats is posed by **insiders**:
  - Rogue, Contract, & Temporary Employees
  - Outsourced key infrastructure components
  - Partner firms such as clients and technology providers
- **Social Engineering**: Con games used to trick employees into revealing information or performing other tasks that compromise a firm
Taking Action as a Mobile User

- Do not turn on risky settings like unrestricted folder sharing on your home PC
- Home networks should be secured with password protection and a firewall
- Use VPN software when accessing corporate systems from public hotspots
- Maintain a strict password regimen involving regular updating and changing default passwords
- Regularly back up systems and destroy data on removable devices after use