TIM 50 - Business Information Systems

Lecture 5

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(Slides initially were produced by Prof. Musacchio)
Class Announcements

- For next time
  - HW 1 due by start of class Tuesday
  - On ecommons'

- Database: **Merrill Room 103**
  - Thursday, 1/21/16, 11:30-1:00pm (today)
  - Friday, 1/22/16, 5:00-6:30pm
  - Monday, 1/25/16, 5:00-6:30pm

- Office hours
  - Thursday, 4:00pm-5:00pm
Class Announcements

- Project proposals due on 1/28!!
  - 2-3 pages
  - Give a plan what you will cover in report
  - Cite some references, and show that you have started your research!

- Remember references must be cited in the body of the text with footnotes or end notes.
Achieving Operational Excellence and Customer Intimacy: Enterprise Applications.

• How do enterprise systems help businesses achieve operational excellence?

• How do supply chain management systems coordinate planning, production, and logistics with suppliers?

• How do customers relationship management systems help firms achieve customer intimacy?

• What are the challenges posed by enterprise applications?

• How are enterprise applications taking advantage of new technologies?
Applications

What is an application?
- Computer software that performs useful capabilities for a user, organization, incorporating storage, manipulation, and communication of information.

An organizational application
- Supports an organization

Often called enterprise application
- (An enterprise is an organization with a commercial mission)
Departmental
Supports a single functional department, e.g., An accounts management application for an accounting department.

Enterprise
Support enterprise-wide processes and goals, e.g., coordinate information between functional departments involved in fulfilling an order. (or other cross functional process.)
Some Types of organizational applications

**Worker Collaboration**
- Example: video conferencing

**Operations and Logistics**
- Example: coordinate movements of goods between sites.

**Decision Support**
  Support decision making by middle managers

**Knowledge Management**
- Organize and retrieve knowledge in company’s documents and databases
Some Types of organizational applications

Software Companies

Customer Relationship Management

- Maintain a case file of customer questions and complaints.
- Website of Freq. Asked Ques. And documentation.
- Chat application for customers to communicate with tech-support personnel.

On-Line Stock Trading

- Information management application for paying customers
- Specialized software to interface with
  - customers
  - stock exchange
  - customer’s bank
Some Types of organizational applications

**Transaction Processing Systems**
record and process data from business transactions.

**Batch Processing**
transactions are accumulated over a period of time and processed periodically.

**Online Transaction Processing (OLTP)**
transactions are processed immediately.

**Workflow Application**
supports ongoing repetitive tasks, e.g., An application that passes a case summary of a customer from customer service to tech support.
Some Types of organizational applications

MRP (Material or Manufacturing Resource Planning)

Take:
- Product Demand forecasts
- Inventory Balances
- Replenishment Lead Times

Develop a Production schedule for a single plant

At this Point, it is a planning tool

Later, added on new functions
- Order processing
- Product costing

The planning tool begins to take more and more of an active role in the business processes.
Each functional department had its own legacy application

- Programmed in different languages
- Different Data formats

Often some data was shared between departments by duplicating it.
MRP evolves into ERP

A common software architecture with modules to support different business functions.

- Accounting, finance, sales, HRM, material management, etc...

Key features:
- Multi-functional
- Integrated
- Modular
So what exactly is ERP??
Enterprise Systems

- Also called “enterprise resource planning (ERP) systems”

- Suite of integrated software modules and a common central database

- Collects data from many divisions of firm for use in nearly all of firm’s internal business activities

- Information created by one process is immediately available for other processes

  - E.g., Alcoa, leading producer of aluminum producer, 31 countries, 200 locations, ERP from Oracle, leading to 20% \( \downarrow \) in overall costs
Built around thousands of predefined business processes & functions that reflect best practices

Financial and accounting processes, including general ledger, accounts payable, accounts receivable, fixed assets, cash management and forecasting, product-cost accounting, cost-center accounting, asset accounting, tax accounting, credit management, and financial reporting

Human resources processes, including personnel administration, time accounting, payroll, personnel planning and development, benefits accounting, applicant tracking, time management, compensation, workforce planning, performance management, and travel expense reporting

Manufacturing and production processes, including procurement, inventory management, purchasing, shipping, production planning, production scheduling, material requirements planning, quality control, distribution, transportation execution, and plant and equipment maintenance

Sales and marketing processes, including order processing, quotations, contracts, product configuration, pricing, billing, credit checking, incentive and commission management, and sales planning
Enterprise applications automate processes that span multiple business functions and organizational levels and may extend outside the organization.

Figure 2-14
ERP Overview

Diagram showing the architecture and industry solutions of Enterprise Resource Planning (ERP) systems. The diagram includes modules for Human Resources, Financials & Accounting, Customer Service, Sales & Distribution, Inventory & Manufacturing, Bolt-ons, and includes connections to central database and industry solutions.
ERP: How Would You Do It?

How would you design an ERP?

Design a user interface for each module

– Ask user to fill in certain “fields” at particular times.
– Set up a sequence of events
  • When the sales department enters an order, that event triggers an event at the manufacturing department.

But by doing this, aren’t we presuming a particular business process?
Question: How standardized are organizational processes?

– Customer service
– Finance
– Manufacturing
– etc
1) Customize the application to existing organization?

Or

2) Mold organization to off-the-shelf application?

– Is software a good way to propagate best practices?
Enterprise Systems

• To implement enterprise software, firms:
  1. Select functions of system they wish to use.
  2. Map business processes to software processes.
  3. Use softwares configuration tables for customizing, e.g., whether it wants to track revenue by product line, geo region, distribution channels, etc.

• If software doesn’t support business processes
  • Businesses can rewrite some portions, but this can compromise information and process integration
  • Changing business processes to match software’s processes is better alternative
Enterprise Systems

How Enterprise Systems Work

- Integrated software modules
- Central database
- Data shared by different business processes
- ...and functional areas

Figure 8-1
The Supply Chain

- Network of organizations and processes for:
  - Procuring raw materials
  - Transforming them into products or intermediate (components or parts)
  - Distributing the products to distribution centers or retails
- Upstream supply chain:
  - Firm’s suppliers, suppliers’ suppliers, processes for managing relationships with them
- Downstream supply chain:
  - Organizations and processes responsible for delivering products to customers
- Internal supply chain
Figure 8-2
This figure illustrates the major entities in Nike’s supply chain and the flow of information upstream and downstream to coordinate the activities involved in buying, making, and moving a product. Shown here is a simplified supply chain, with the upstream portion focusing only on the suppliers for sneakers and sneaker soles.
• Inefficiencies* cut into a company’s operating costs
  • Can waste up to 25 percent of operating expenses
• Just-in-time strategy (if w/ perfect info)
  • Components arrive as they are needed
  • Finished goods shipped after leaving assembly line
• Safety stock (w/ uncertainties)
  • Buffer for lack of flexibility in supply chain
• Bullwhip effect
  • Information about product demand gets distorted as it passes from one entity to next across supply chain

*: parts shortages, underused plant capacity, excessive goods, etc.
Inaccurate information can cause minor fluctuations in demand for a product to be amplified as one moves further back in the supply chain. Minor fluctuations in retail sales for a product can create excess inventory for distributors, manufacturers, and suppliers.

Figure 9-3
Supply Chain Management Software

- **Supply chain planning systems (planning)**, e.g., a larger than normal order
  - Model existing supply chain.
  - Demand planning & forecast.
  - Optimize sourcing, manufacturing plans.
  - Establish inventory levels.
  - Identify transportation modes.

- **Supply chain execution systems (executing)**
  - Manage flow of products through distribution centers and warehouses, i.e., track the physical status of goods, materials, warehouse, shipment, etc.
Global Supply Chains and the Internet

- Global supply chain issues:
  - Greater geographical distances
  - Greater time differences
  - Participants from different countries
    - Different performance standards
    - Different legal requirements
- Internet helps companies manage global complexities
  - Warehouse management
  - Transportation management
  - Logistics
- Outsourcing
Demand-Driven Supply Chains

Supply chain management systems

- **Push-based model (build-to-stock)**
  - Schedules based on “best” guesses of demand, i.e., push products to customers

- **Pull-based model (demand-driven): with “real-time” web-based SCM available**
  - Customer orders trigger events in supply chain

- **Help businesses move from sequential supply chains to concurrent supply chains**
The difference between push- and pull-based models is summarized by the slogan “Make what we sell, not sell what we make.”

**Push-Based Model**
- Supplier: Supply to forecast
- Manufacturer: Production based on forecasts
- Distributor: Inventory based on forecasts
- Retailer: Stock based on forecasts
- Customer: Purchase what is on shelves

**Pull-Based Model**
- Supplier: Supply to order
- Manufacturer: Produce to order
- Distributor: Automatically replenish warehouse
- Retailer: Automatically replenish stock
- Customer: Customer orders

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**Figure 8-5**
Push- Versus Pull-Based Supply Chain Models

The difference between push- and pull-based models is summarized by the slogan “Make what we sell, not sell what we make.”

Push-Based Model
- Supplier: Supply to forecast
- Manufacturer: Production based on forecasts
- Distributor: Inventory based on forecasts
- Retailer: Stock based on forecasts
- Customer: Purchase what is on shelves

Pull-Based Model
- Supplier: Supply to order
- Manufacturer: Produce to order
- Distributor: Automatically replenish warehouse
- Retailer: Automatically replenish stock
- Customer: Customer orders

Discussions: any examples of push- and pull-based model?

Figure 8-5
The Emerging Internet-Driven Supply Chain

Figure 9-5
The emerging Internet-driven supply chain operates like a digital logistics nervous system. It provides multidirectional communication among firms, networks of firms, and e-marketplaces so that entire networks of supply chain partners can immediately adjust inventories, orders, and capacities.
Business Value of Supply Chain Management Systems

- Match supply to demand.
- Reduce inventory levels.
- Improve delivery service.
- Speed product time to market.
- Use assets more effectively.
- Reduced supply chain costs lead to increased profitability.
  - Total supply chain costs can be 75 percent of operating budget.
- Increase sales.
What Is Customer Relationship Management?

• Knowing the customer
  • In large businesses, too many customers and too many ways customers interact with firm

• Customer relationship management (CRM) systems, a “single place” that
  • Captures and integrates customer data from all over the organization.
  • Consolidates and analyzes customer data.
  • Distributes customer information to various systems and customer touchpoints across the enterprise.
  • Provides a single enterprise view of customers.
CRM systems examine customers from a multifaceted perspective. These systems use a set of integrated applications to address all aspects of the customer relationship, including customer service, sales, and marketing.

Figure 9-6
Customer Relationship Management (CRM): Functions

CRM systems examine customers from a multifaceted perspective. These systems use a set of integrated applications to address all aspects of the customer relationship, including customer service, sales, and marketing.

Figure 9-6

CRM answers following questions:
1) What is the value of a particular customer to the firm over his/her life time?
2) Who are our most loyal customer?
3) What do these profitable customers want to buy?

- Campaign data
- Content
- Data analysis
- Call center data
- Web self-service data
- Wireless data
CRM Software

- CRM packages range from niche tools to large-scale enterprise applications.

- More comprehensive have modules for:
  - Partner relationship management (PRM): Selling partners
    - Integrating lead generation, pricing, promotions, order configurations, and availability
    - Tools to assess partners’ performances
  - Employee relationship management (ERM)
    - Setting objectives, employee performance management, performance-based compensation, employee training
CRM Software

CRM packages typically include tools for:

- **Sales force automation** (SFA)
  - Focus sales on most valuable customers: sales prospect and contact information, sales quote generation capabilities

- **Customer service**: increase efficiency of call centers, help desks
  - Assigning and managing customer service requests, Web-based self-service capabilities

- **Marketing**: support direct-market campaigns
  - Capturing prospect and customer data, scheduling and tracking direct-marketing mailings or e-mail, cross-selling
How CRM Systems Support Marketing

Customer relationship management software provides a single point for users to manage and evaluate marketing campaigns across multiple channels, including e-mail, direct mail, telephone, the Web, and wireless messages.

Figure 9-7

Responses by Channel for January 2014 Promotional Campaign

- Direct Mail: 29.2%
- Telephone: 30.8%
- Web: 17.3%
- E-mail: 16.0%
- Cell Phone Text Message: 6.7%
The major CRM software products support business processes in sales, service, and marketing, integrating customer information from many different sources. Included are support for both the operational and analytical aspects of CRM.

Figure 9-8
This process map shows how a best practice for promoting customer loyalty through customer service would be modeled by customer relationship management software. The CRM software helps firms identify high-value customers for preferential treatment.
Operational and Analytical CRM

• **Operational CRM:**
  • Customer-facing applications such as sales force automation, call center and customer service support, and marketing automation

• **Analytical CRM:**
  • Analyzes customer data output from operational CRM applications
  • Based on data warehouses populated by operational CRM systems and customer touch points
  • **Customer lifetime value (CLTV)**
Analytical CRM uses a customer data warehouse and tools to analyze customer data collected from the firm’s customer touch points and from other sources. *OLAP: online analytical processing

**Figure 8-11**

Churn rate: Number of customers who stop using or purchasing products or services from a company
Business Value of Customer Relationship Management

- **Business benefits:**
  - Increased customer satisfaction
  - Reduced direct-marketing costs
  - More effective marketing
  - Lower costs for customer acquisition/retention
  - Increased sales revenue

- **Churn rate:**
  - Number of customers who stop using or purchasing products or services from a company
  - Indicator of growth or decline of firm’s customer base
Enterprise Application Challenges

- Highly expensive to purchase and implement enterprise applications—total cost may be four to five times the price of software
- Technology changes
- Business process changes
- Organizational changes
- Switching costs, dependence on software vendors
- Data standardization, management, cleansing
Enterprise Application Challenges

- Highly expensive to purchase and implement enterprise applications
  - Average cost of ERP system is more than $7 million
  - Average completion time is more than 17 months
- Deep-seated technology changes
- Business process changes
- Organizational learning, changes
- Switching costs, dependence on software vendors
- Data standardization, management, cleansing
Next-Generation Enterprise Applications

- To bring greater value from enterprise applications
  - **Enterprise solutions/suites**: make applications more flexible, Web-enabled, integrated with other systems
  - Inclusion of SOA (service oriented architecture) standards to link to 3rd party software
  - Open-source applications
  - Cloud-based, on-demand solutions
Next-Generation Enterprise Applications

• Social CRM
  • Incorporating social networking technologies, e.g., Facebook, Twitter
  • Company social networks
  • Customer interaction via Facebook
  • E.g., Buzzient platform integrates social media with enterprise applications to analyze social media activities in Facebook, Twitter, etc.

• Business intelligence (BI)
  • Inclusion of BI with enterprise applications, e.g., flexible reporting, ad hoc analyses, interactive dashboards
  • Flexible reporting, ad hoc analysis, “what-if” scenarios, digital dashboards, data visualization