TIM 50 - Business Information Systems

Lecture 7

Instructor: Terry Allen
UC Santa Cruz
10/19/2011

Most slides are by Professor John Musacchio
Outline

- Announcements
- Information Management
- Student Presentation (news)
- Enterprise Applications
- Enterprise Resource Planning
- CISCO case
Announcements

- Business Paper proposals due today!
- Online Forum on course web page
  - alternative way to earn participation points!
    - how it relates to class
    - Use terminology from class
- Make-up class here, Friday 10/28
- Assignment 2 will post tonight, due 10/28
- Reading for next time (10/24):
  - Messerchmitt 3.4 - 3.6 (pp. 83-98)
  - Alibris Case (reader pp. 137-148)
Instructor
- Terry Allen (terry_allen@hotmail.com)
  - Office Hours:
    - Mon. & Wed., 7:00 – 8:00 p.m. here and in E2-563
    - Tues., 4:00 – 5:00 p.m. in E2-563
    - Tues., 5:00 – 6:00 p.m. in E2-563 if
      - Students are still dropping in at 5:00 p.m., or
      - You have asked in advance by email for me to stay late, or
      - Some other student has asked me to stay late

TA
- Huascar Sanchez (hsanchez@soe.ucsc.edu)
  - Office Hour: Wednesday, 10:00 – 11:00 a.m. in Jack’s Lounge
- TBD ()
  - Office Hour: TBD
Announcements

Forthcoming presentations

- 10/24/2011
  - ?? (news story)
  - ?? (Alibris Case)

- Send me your slides the night before
  - Failing to do so may result in loss of points (after 9 p.m.)
Information Management (Review)
What is Information?

- **Data**
  - Numbers, Character strings, etc.

- **Information**
  - Recognizable patterns of data organized so as to inform or influence the user in some way

- **Knowledge**
  - Concepts, relationships, truths, principles derived from information, leavened with some amount of judgment

- **Wisdom**
  - Insight or judgment acquired from extensive knowledge and (usually) experience
Classify these

- “XV”, “SF”, 34, “CN”, 16
- The 49-ers won Super Bowl XV by a score of 34 to 16.
- The National Football Conference wins 17 out of 20 Super Bowl’s on average.
- The best team usually wins.
Classify these

- 47, 560, 134
- My bank account has 47$ in it  :-(
- My net worth, including my bank account and subtracting the debts is 560$
- At the rate my net worth is increasing, and given my age and expectations for retirement income, I can’t retire until age 134...
Roles in information access

Adapted from slides for *Understanding Networked Applications* by David G Messerschmitt. Copyright 2000. See copyright notice.
In the Networked Era...

User
Author or publisher
Indexer or organizer
Librarian
Recommender

How are these roles being changed by networked computing?

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By David G Messerschmitt. Copyright 2000. See copyright notice
Finding useful information

- **Search**
  - Item search
  - Topic search

- **Browse**
  - “Explore” in a less definite way in order to find useful information
  - Iterate/refine searches

- **Navigate**
  - Follow directions/links to find information
  - On the web you do all of these!
Others can help….

- **Author:**
  - Hyperlink
    - (Reference to related information)

- **Author or third party:**
  - Index
    - (List of content)
  - Metadata
    - (Description of content)

- **Third party:**
  - Reviews or recommendations
    - (Judgment of content)

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Exercise

Give an example of the following functions in the context of movie rentals:

Hyperlink
Index
Metadata
Recommendation
Authors - Publishers
Creates information - verifies, makes available
Indexers

Classifies information
Indexers/Organizers - Librarians (assists and guides user to needed info)
Librarians

THE ACM DIGITAL LIBRARY

Full text of every article ever published by ACM.

- **Using the ACM Digital Library**
- **Frequently Asked Questions (FAQ's)**

Recently loaded issues and proceedings:
(available in the DL within the past 2 weeks)

- ACM Computing Surveys (CSUR)
  - **Volume 39 Issue 1**
- Journal of the ACM (JACM)
  - **Volume 54 Issue 2**
- Journal on Educational Resources in Computing (JERIC)
  - **Volume 6 Issue 2**
- ACM Transactions on Asian Language Information Processing (TALIP)
  - **Volume 6 Issue 1**
  - **Volume 5 Issue 4**

Advanced Search

Browse the Digital Library:
- Journals
- Magazines
- Transactions
- Proceedings
- Newsletters
- Publications by Affiliated Organizations
- Special Interest Groups (SIGs)
- ACM Oral History interviews

Personalized Services: [Login required]

- **My Binders**
  Save search results and queries. Share binders with colleagues and build bibliographies.

- **TOC Service**
  Receive the table of contents via email as new issues or proceedings become available.

CrossRef Search
Pilot program to create full-text interpublisher searchability.

Feedback
- **Report a problem**
- **Take our Satisfaction survey**
Recommenders
What do customers ultimately buy after viewing this item?

74% buy the item featured on this page:
Canon PowerShot A630 8MP Digital Camera with 4x Optical Zoom★★★★★★
$215.40

9% buy
Canon PowerShot A540 6MP Digital Camera with 4x Optical Zoom★★★★★

7% buy
Canon PowerShot A640 10MP Digital Camera with 4x Optical Zoom★★★★★
$279.99

5% buy
Canon PowerShot A710 IS 7.1MP Digital Camera with 6x Image-Stabilized Optical Zoom★★★★★
$259.99

Customers who bought this item also bought
Lexar Media 1 GB Secure Digital Memory Card (SD1GB-231) (Retail Package) by Lexar
Sony BCG-34HE4 Super-Quick Worldwide Battery Charger with 4 AA NiMH Batteries by Sony
Canon PSC-65 Deluxe Soft Case for A550, A560, A570IS, A630, A640, A700 & A710IS Digital Cameras by Canon
2GB Secure Digital by SanDisk

Explore similar items: Electronics (22) Camera & Photo (13)
Push vs. pull

User

Control over what is provided
Time when it is provided

Intermediate cases:
Notification
Subscription

Push

Publisher (autonomous source)

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What are some differences between push and pull with respect to:

- invasiveness with respect to the user?
- suitability of the information received?
- timeliness of the information received?
## Characteristics of information pull and push

<table>
<thead>
<tr>
<th></th>
<th>Pull</th>
<th>Push</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td>User requests specific information</td>
<td>User subscribes to information in general</td>
</tr>
<tr>
<td><strong>Notification</strong></td>
<td>User submits question - publisher answers</td>
<td>Publisher provides useful notifications - user decides what to do</td>
</tr>
<tr>
<td><strong>Timing</strong></td>
<td>Information is user-directed</td>
<td>Information provider-directed</td>
</tr>
</tbody>
</table>
Proper roles of push and pull in a workgroup

<table>
<thead>
<tr>
<th>Pull: work</th>
<th>Push: attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brainstorming</td>
<td>Notification of topic</td>
</tr>
<tr>
<td>Accessing documents</td>
<td>Notification of document availability</td>
</tr>
<tr>
<td></td>
<td>Reminder of deadlines</td>
</tr>
</tbody>
</table>

*Newsgroups and Web*  
*Email*

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Some modalities of information access

- **Pull**
  - Search, navigate, browse

- **Push**
  - Aggregate, filter, consolidate

- **Subscribe**

- **Intermediary**

- **Delegate**

- **Agent**

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Student Presentations

- 10/19/2011
  - Sean Phillips (news story)
  - Lee Der Lan (Cisco Case)
Enterprise Applications
Applications

- What is an application?
  - Computer software that performs useful capabilities for a user or organization
  - Stores, manipulates, and/or communicates information.
- An organizational application
  - Supports an organization
- Often called enterprise application
  - (An enterprise is an organization with a mission (usually commercial, of course))
- Managing an organization:
  coordination+communication
Types of organizational applications

1. Departmental
   - Supports a single functional department
   - Example: An accounts management application for an accounting department.

2. Enterprise
   - Support enterprise-wide processes and goals.
   - Example: coordinate information between functional departments involved in fulfilling an order.
     (or manufacturing, or other cross-functional process.)

3. Commerce
   - Supports the purchase/delivery of goods/services
   - Example: product support over the Internet
   - Example: product returns handling
Classification of organizational applications

- **Worker Collaboration**
  - Example: video conferencing

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

- **Decision Support**
  - Summarize info for execs.

- **Knowledge Management**
  - Organize and retrieve knowledge in company’s documents and databases

- **Customer outreach**
  - Can the network offer new ways to connect to customers?
Examples of organizational applications

- **Customer care (software4u.com)**
  - FAQ - knowledge base
  - Customer service & tech support

- **On-line Bookselling (books4u.com)**
  - Specialized software to interface with: customers, stock exchange, Customer’s bank

- **On-line Stock Trading (stocks4u.com)**
  - Information provider

- **Floral delivery service (flowers4u.com)**
  - Suppliers and small businesses without IS
Departmental Applications

- **On-line Transaction Processing**
  - record and process data from business transactions.
  - Info resides in Database Management System (DBMS)

- **Workflow**
  - *A workflow application supports ongoing repetitive tasks.*
  - *Example: An application that passes a case summary of a customer from customer service to tech support.*
Business Process Re-engineering

- Also called Business Transformation

- Radical re-thinking and re-design of business processes
  - Enabled by Networked Information Systems
  - Minimize cost/time, increase efficiency, improve quality
  - Combine what people can do well with what computers can do well

- 5 phases
Business Process Re-engineering

- Analysis
  - of business requirements and costs

- Design
  - of individual activities
  - of information and materials’ flow

- Development
  - of application

- Deployment
  - Including training, testing, installation (may have pilots)

- Operation
  - Supporting the application (production, sales, distribution etc.)

- Analogous to a software application’s lifecycle
Enterprise Resource Planning (ERP)
So what exactly is ERP??
Material (Manufacturing) Requirements Planning - MRP

- The precursor of ERP
- MRP: A production planning and inventory control system
  - Take:
    - Product Demand forecasts
    - Inventory Balances
    - Replenishment Lead Times
  - Develop a production schedule for a single plant
MRP

Initially was a planning tool
- WHAT items are required
- HOW MANY are required
- WHEN are they required

Later other functionalities were added
- Order Processing
- Product Costing

The planning tool begins to take more and more of an active role in the business processes
A desire to Link Across Functional Departments

- 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

- ERP applications support different business processes that are standardized across organizations
  - Accounting, sales, HRM, material management, CRM, supply chain management, project management, etc...

- Key features:
  - Multi-functional
  - Integrated
  - Modular
Information Integration

Key issue
Should integrate different data/applications

CONSTRAINT: Legacy Applications

- Applications developed using obsolete technology and worked well for many years...
  - e.g. most commercial applications were built using COBOL
- ...until not anticipated problems occurred
  - e.g. the Year 2000 (Y2K) problem
  - Some applications were built 40 years ago
  - The programmers used last 2 digits to represent the year: “1/1/00” => 1900 or 2000?
- Y2K made many enterprises replace their legacy systems with ERP solutions
ERP

- 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
    - E.g. When the sales department enters an order, that event triggers an event at the manufacturing department.
Fundamental options

- **Build in-house?** using a company's own funds, staff, or resources.
- **Customize the off-the-shelf application to existing organization?** refers to products that have already been designed and made.
- **Mold organization to off-the-shelf application?**
  - Adapt business processes to “Best practices”
  - When there exist compliance requirements or when process is a commodity
- **If all companies use the same “best practices” how can they gain competitive advantage?**
  - Can ERP vendors even penetrate the 'trade secret' barrier?
ERP Implementation

- Very complex application
- Typically not implemented “in-house”
  - Purchase off-the-self solution and customize it
  - Adapt existing applications to “speak” with ERP modules
  - Hire consultants to help you (e.g. KPMG, Accenture)

- Top-5 ERP Vendors [Gartner Dataquest (2005)]:
  - SAP
  - Oracle
  - sage
  - Microsoft
  - SSA global
**Decision Support**

- **ERP support enterprise operations AND managerial decisions**
  - Provision of timely Information - as it happens
  - Tools for data summarization and presentation - data aggregation and summarization
  - Knowledge management & discovery - search tools
Knowledge management systems: Turn data and information into knowledge

- **Data warehouses** store operations’ historical data
  - Provide functionalities for summarizing, aggregating, reporting on these data
  - OLTP (on-line transaction processing) vs. OLAP (on-line analytical processing)

- **Data mining** is the process of discovering patterns in large amounts of data

- We will elaborate later in the quarter
The CISCO Case
Success Factors

- Cross-Functional Team of top people
  - People from across the company involved
- Hungry Vendors
  - Oracle and KPMG needed this to succeed
- Strong Support from Top Management
- Favorable Hardware Contract
- Rapid Prototyping - conference room pilots
- Aggressive pace

Good management or luck?
Cisco Summary

Challenges

- Poor testing Strategy
- Inadequate Hardware
- Software required more modifications than originally hoped.
Cisco Summary

What did it cost?

Costs Beyond original budget:

Non-IT Personnel In Project
- 80 personnel \( \times 8 \text{ months} \times 160 \text{ hours / month} \times 100 \text{ hour} = $10 \text{ million} \)

IT-Personnel beyond original 20
- 80 personnel \( \times 4.5 \text{ months} \times 160 \text{ hours / month} \times 100 \text{ hour} = $5.7 \text{ million} \)

Actually cost more than 15 million more than the original budget of $15 million!

Was this really a success?!