Announcements

- Key for Assignment 2 will be on website
- MIDTERM next Tuesday, February 8

Review: ERP applications

- 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

Mid-quarter Feedback

- On Thursday
- Your opinion counts!

Reading for next class

- Messerschmitt Ch 5 (139-154)
- Sun-N Tier Case (145-164 + figs)
  - SUGGESTION: Start with Messerschmitt
- This material will NOT be included in the midterm

Forthcoming presentations

- Feb 3
  - Raashi Bhatnagar (news story)
  - Omar Alexander Calles (Case: Sun-N Tier)
- Send me your slides the night before
  - Failing to do so will result in losing points
- All previous presentations are online
  - Open the presentation list and follow the links
**Student Presentations**

- Feb 1
  - Alan Mah (case: Alibris)
  - Grecia Rivera (news story)
  - Brett Louis Boles (news story)

**Review: E-Commerce**

- **Major Categories**
  - Consumer (B2C)
  - Inter-consumer (C2C)
  - Inter-enterprise (B2B)

**B2C Examples**

- Amazon.com
- Fruity's (Fry's)
- Barnes & Noble
- Zappos
- Nordstrom
- buy.com

**Consumer e-commerce (B2C)**

- What are the advantages and disadvantages compared to a retail store or direct mail catalog?
Some Advantages

- For the Consumer
  - Check prices at many vendors with minimal effort
  - Anonymity
  - Mass customization
  - Order tracking
  - Recommendations

- For the Business
  - Global reach
  - Automate order taking (cost savings)
  - Price Discrimination

Recommender Systems

How do they work?

C2C Examples

Inter-Enterprise E-Commerce (B2B)

- **Procurement**
  - One enterprise purchases goods or services from another

- **Direct Procurement**
  - Ongoing, consistent, and scheduled procurement

- The relationship between firms involved in direct procurement often called a Supply Chain

Supply Chain Management (SCM)

*SCM* is the set of activities associated with managing a supply chain.

SCM (supply chain management)

- Need to manage the procurement of parts
  - Don’t run out of any one
  - Don’t order too many
  - Order far enough in advance

- Ideally
  - Know in advance
    - # cars
    - features
**SCM - Mass customization**

- Thousands of orders per day, each with different requirements!
- Adjusting orders from suppliers constantly according to demand
- Minimal inventories
  - Cut costs
  - Much more sensitive to errors or disruptions
- **Mass customization** requires sophisticated SCM

**Networked Computing in direct procurement**

- **Electronic Data Interchange (EDI)**
  - Exchange order information between firms involved in direct procurement
  - Existed since 70's
  - Usually large firms who could afford proprietary communication links
  - Initially order and invoice
- **Financial EDI (FEDI)** later added EFT payment capability

**Networked Computing in direct procurement**

- **XML** (Extensible Markup Language) is another data interchange format making an impact on inter-enterprise commerce

**Indirect Procurement**

- Sporadic purchase of goods and services to support organizational objectives
  - Example: Office Furniture, office supplies, etc.

**The Founding of Alibris**

- In the rare, used, and out-of-print book business.
- Started as a small business named Interloc.
- Interloc's website
  - Just a bulletin board service, or BBS, which only connected book buyers with various locally based suppliers from all over the country.
- Interloc made money by charging dealers a fee for listing their books on Interloc's servers.
- Consisted of 1,300 dealers and 5 million books

**Interloc Becomes Alibris**

- Marty Manley meets with investors and becomes CEO of Alibris.
- Must turn Alibris into an e-commerce company so Amazon can use it.
- They face big IT problems
  - 5 million books come from many individual dealers with different prices and conditions of sale, all of which needed to be catalogued, searchable, and reliable
**Alibris Goal**

- World wide place order with Alibris, first send from dealer.
- Fast Search (used by Amazon)
- Then controlled shipping/customer service
  - Sparks facility
- Increase their order fill rate and only do business with dealers with over 1,000 books in stock
- Collect 20% of sales and increase the sale price of the books.

**IT Challenges**

- Move database from Massachusetts (Interlock) to California
- Each book was a separate record
- Used Oracle’s off-the-shelf eCommerce software
  - Bugs and didn’t work because it was so new.
- IT crisis drains money supply
- T1 connection didn’t work for a very long time.
- Ended up with a totally customized eCommerce software after spent a fortune on Oracles software.

**Solution -results**

- Thunderstone solved the crisis
  - Unsure if a small company can do it
  - Thunderstone could handle their software needs
- An investor offered 200,000 to keep the company afloat - demanded control over the company and the firing of most of the IT staff.

- This case shows that a start-up can’t be run by consultants.
- Alibris now has over 60 million used, new, and out of print books

**Alibris**

- Why did Interloc succeed so early on?

**Alibris**

- If Interloc is so successful, why change it?
- What will change as Interloc becomes Alibris?
- Why did Manley feel they needed the Sparks facility?
Alibris

Should Alibris actually buy books and fill up the Sparks facility?

Why is Alibris having so much trouble setting up simple e-commerce capabilities?

Is this really that hard??

Is it rare for a new-software product from an established, reputable vendor not to work properly?

Should Alibris stick with Oracle? Or switch back to Thunderstone?

Should Manley take the "white knight's" offer and fire the whole IT staff??!

Alibris

Rejects "white knight" offer
- Manley secures another bridge loan
- Goes Live in 1998
- Thunderstone's software works ok
- 1 million books at Sparks warehouse by 2000
  - Originally all on consignment from dealers
  - Later, purchases books
- 2002 – Revenue $31 million, loss $7.2 million
- 2003 – Revenue $45.5 million, loss $4.8 million
- March 2004 files for "auction based" IPO
  - May 2004, withdraws IPO after price too low
  - Relying on Private Financing (venture capital) until 2006 when it was purchased by a private equity firm

Data and information

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**Key concept**

- The key commodity manipulated by information technology is information
- In order to be manipulated in a computing/networking environment, information must be represented by data

**Information**

- From a user (human) perspective...
  - recognizable patterns that influence you in some way (perspective, understanding, behavior...)

- In the computing infrastructure, information has a somewhat different connotation as structure and interpretation added to data

**Data**

- A **bit** is "0" or "1" — the atom of the information economy
- **Data** is a collection of bits, like
  - "01101110110110110"
  - "0000011"
  - "1101110101101011011110110110101"

- Note: the terms data and information are not always used consistently!

**Data -> Information**

- Data itself does not represent anything meaningful
  - E.g. "101111"

- Should also know:
  - Structure
  - Interpretation mechanism

- This representation is necessary in order to recover the information
  - It is not unique!

**Example**

- Bits: 0, 1
- Data: A sequence of bits
  - 101111
- Interpretation, Structure:
  - Base-2 number (least significant bit is on the right)
  - Represents a number
    - $101111 = 2^6 + 2^5 + 2^4 + 2^3 + 2^1 + 2^0 = 47$
  - In a higher level this number may represent something else
    - E.g. The amount of $\$\$ in my bank account :(

**Data Representation**

- Takes the place of the original
- Equivalent to, in the sense that the original can be reconstructed from its representation

- Often the original can only be approximately reconstructed, although it may be indistinguishable to the user
  - E.g. audio or video
ASCII

American Standard Code for Information Interchange

<table>
<thead>
<tr>
<th>Character</th>
<th>Hex</th>
<th>Binary</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;7&gt;</td>
<td>/x37</td>
<td>00110111</td>
</tr>
<tr>
<td>&lt;8&gt;</td>
<td>/x38</td>
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<td>/x39</td>
<td>00111001</td>
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<tr>
<td>:&gt;</td>
<td>/x3A</td>
<td>00111010</td>
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<tr>
<td>;&gt;</td>
<td>/x3B</td>
<td>00111011</td>
</tr>
<tr>
<td>&lt;&lt;=</td>
<td>/x3C</td>
<td>00111100</td>
</tr>
<tr>
<td>=&gt;</td>
<td>/x3D</td>
<td>00111101</td>
</tr>
<tr>
<td>/&gt;&gt;</td>
<td>/x3E</td>
<td>00111110</td>
</tr>
<tr>
<td>&lt;?&gt;</td>
<td>/x3F</td>
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<td>/x40</td>
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<td>/x43</td>
<td>01000011</td>
</tr>
<tr>
<td>D&gt;</td>
<td>/x44</td>
<td>01000100</td>
</tr>
</tbody>
</table>

Character encoding (128 characters ≈ 2^7)

Note that this representation is not unique...

...this one happens to be a standard (ANSI X3.110-1983)

Representation needs to be standardized

If the representation is not standardized, the information is garbled!

Terminology

Information

Representation

Data processing

Data

Communicate data to another user or organization

A picture

This picture conveys information

This information is represented in this computer, but how?

Color picture

A color picture can be represented by three monochrome images...

RGB

...at the expense of three times as many bits

Representation of picture: image

Expanding a small portion of the picture, we see that it is represented by square pixels...

...300 tall by 200 wide... 

...with a range of 256 intensities per pixel

300 • 200 • 8 bits = 480,000 bits (but it can be compressed)

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Regeneration

- Make a precise copy of the data (copy bit by bit)
- If you know the representation, this is equivalent to making a precise copy of the information
- Each such precise copy is called a generation
- The process is called regeneration

Replication of information

Analog information cannot be regenerated

- Analog information can be copied, but not regenerated
- We will never know exactly what the original of this Rembrandt looked like

Discrete information can be regenerated

- Regeneration is possible for information represented digitally (which is tolerant of physical deterioration)
- Regeneration can preserve data (but not its original physical form)
- $0 + \text{noise} \not\equiv 0$
- $1 + \text{noise} \not\equiv 1$

Replication of information requires knowledge of representation

- Replication of information also presumes knowledge of its representation
- Replication preserves the integrity of the data, but that is not sufficient

Implications

- Digitally represented information can be preserved over time or distance in its precise original form by occasional regeneration
  - digital library
  - digital telephony
- Replication of data is easy and cheap
Implications (con't)

- Replication of information requires knowledge of the structure and interpretation
  - Standardization or some other means

- You can give away or sell and still retain
- Unauthorized replication or piracy relatively easy