Class Announcements

- (Regular) Assignment 2 Due 4/29
- Database Assignment 1 Due 5/1

- READ: Messerschmitt Ch 5

Web 2.0, Social Networking, and the Wisdom of Crowds

- Most popular Web 2.0 service: social networking
  - Social networking sites sell banner ads, user preference information, and music, videos and e-books.
  - Social shopping sites
  - Swap shopping ideas with friends (Kaboodle, ThisNext)
- Wisdom of crowds
  - Large numbers of people can make better decisions about topics and products than a single person.
  - Prediction markets: peer-to-peer betting markets on specific outcomes (elections, sales figures, designs for new products)

E-commerce: Business and Technology

How an Advertising Network Works

- History predates Internet
- Electronic Data Interchange (EDI)
  - Exchange order information between firms involved in direct procurement
  - Usually large firms who could afford proprietary communication links
  - Initially order and invoice
  - Existed since 70’s
Business-to-Business Electronic Commerce: New Efficiencies and Relationships

- Electronic data interchange (EDI)
  - Major industries have EDI standards that define structure and information fields of electronic documents for that industry.
  - More companies increasingly moving away from private networks to Internet for linking to other firms.

- Private industrial networks (private exchanges)
  - Large firm using extranet to link to its suppliers, distributors, and other key business partners
  - Owned by buyer
  - Permits sharing of:
    - Product design and development
    - Marketing
    - Production scheduling and inventory management
    - Unstructured communication (graphics and e-mail)

- Net marketplaces (e-hubs)
  - Single market for many buyers and sellers.
  - Industry-owned or owned by independent intermediary.
  - Generate revenue from transaction fees, other services.
  - Use prices established through negotiation, auction, RFQs, or fixed prices.
  - May focus on direct or indirect goods.
  - May be vertical or horizontal marketplaces.

Electronic Data Interchange (EDI)

- Companies use EDI to automate transactions for B2B e-commerce and continuous inventory replenishment.

A Private Industrial Network

M-Commerce Services and Applications

- Although m-commerce represents small fraction of total e-commerce transactions, revenue has been steadily growing
  - Location-based services
  - Banking and financial services
  - Wireless advertising
  - Games and entertainment
Data and information

by
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Key concept
The key commodity manipulated by information technology is information. To be manipulated in a computing/networking environment, information must be represented by data.

What is information?

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
- “0101101101010110”
- “0000011”
- “111011010101010111011101101101010”
Note: the terms data and information are not always used consistently!

Representation
- Take 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

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<th>Hex</th>
<th>Binary</th>
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<td>00111100</td>
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<tr>
<td>&lt;D&gt;</td>
<td>x44</td>
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</table>

Note that this representation is not unique…
…this one happens to be a standard (ANSI X3.110-1983)

A picture

This picture conveys information

This information is represented in this computer, but how?

Representation of picture: image

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

Structure

….300 tall by 200 wide….

Interpretation

….with a range of 256 intensities per pixel

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

Color picture

A color picture can be represented by three monochrome images…

At the expense of three times as many bits

Terminology

Representation needs to be standardized

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

Communicate data to another user or organization
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
- Process is called regeneration

Replication of information

- Anything that can be regenerated can be replicated any number of times

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 can preserve data (but not its original physical form)
- Regeneration is possible for information represented digitally (which is tolerant of physical deterioration)

0 + noise → 0
1 + noise → 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
- Every .xxx DOS file is a representation