Privacy and Technology

Securing the eCampus
2012
Scope of information gathering/storage/monitoring

### Overload

Global information created and available storage (Exabytes)

- **FORECAST**
- Information created
- Available storage

Source: IDC

Feb 25th 2010 | From The Economist print edition

DARTMOUTH COLLEGE
# Scope of information gathering/storage/monitoring

## Data inflation

<table>
<thead>
<tr>
<th>Unit</th>
<th>Size</th>
<th>What it means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit (B)</td>
<td>1 or 0</td>
<td>Short for &quot;binary digit&quot;, after the binary code (1 or 0) computers use to store and process data.</td>
</tr>
<tr>
<td>Byte (B)</td>
<td>8 bits</td>
<td>Enough information to create an English letter or number in computer code. It is the basic unit of computing.</td>
</tr>
<tr>
<td>Kilobyte (KB)</td>
<td>1,000, or $2^{10}$ bytes</td>
<td>From &quot;thousand&quot; in Greek. One page of typed text is 2KB.</td>
</tr>
<tr>
<td>Megabyte (MB)</td>
<td>1,000,000, or $2^{20}$ bytes</td>
<td>From &quot;large&quot; in Greek. The complete works of Shakespeare total 5MB. A typical pop song is about 4MB.</td>
</tr>
<tr>
<td>Gigabyte (GB)</td>
<td>1,000,000,000, or $2^{30}$ bytes</td>
<td>From &quot;gigant&quot; in Greek. A two-hour film can be compressed into 1-2GB.</td>
</tr>
<tr>
<td>Terabyte (TB)</td>
<td>1,000,000,000,000, or $2^{40}$ bytes</td>
<td>From &quot;triumph&quot; in Greek. All the catalogued books in America’s Library of Congress total 15TB.</td>
</tr>
<tr>
<td>Petabyte (PB)</td>
<td>1,000,000,000,000,000, or $2^{50}$ bytes</td>
<td>All letters delivered by America’s postal service this year will amount to around 5PB. Google processes around 4PB every hour.</td>
</tr>
<tr>
<td>Exabyte (EB)</td>
<td>1,000,000,000,000,000,000, or $2^{60}$ bytes</td>
<td>Equivalent to 10 million copies of The Economist.</td>
</tr>
<tr>
<td>Zetta byte (ZB)</td>
<td>1,000,000,000,000,000,000,000, or $2^{70}$ bytes</td>
<td>The total amount of information in existence this year is forecast to be around 1.2ZB.</td>
</tr>
<tr>
<td>Yotta byte (YB)</td>
<td>1,000,000,000,000,000,000,000,000, or $2^{80}$ bytes</td>
<td>Currently too big to imagine.</td>
</tr>
</tbody>
</table>

Source: The Economist

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[http://www.economist.com/leaders](http://www.economist.com/leaders)
Who has the information?

- Government
- Banks, Insurers, CC companies
- Google, Amazon, Facebook, Twitter
- Browsers, websites
- Cell phone, cell service provider, apps
- Hospitals, doctors, universities
- Supermarket, library, easyPass
Property rights: number of studies that find that people not willing to pay very much to protect privacy, i.e., to limit information sharing.

However, some of research is problematic in that confounds desire for privacy with the purchase of good or service, that is, only way to limit sharing of information is to not purchase the service.
Conceptions of privacy

- No right to privacy: privacy interests are not distinctive because the personal interests they protect are economically inefficient (Posner, 1981)
- “If you aren’t doing anything wrong, then what do you have to hide?”
- Only people who want to conceal unlawful activity should be concerned
- But, people engaged in illegal conduct have no legitimate claim to privacy
Difference between privacy and secrecy:

US versus Europe: Information data laws in Europe it is illegal to release personal data to a third party, or even to use it for a purpose unrelated to the reason for which it was collected, without the subject's consent.

Nissenbaum’s
Privacy as Contextual Integrity

- Information use/flow depends on norms
- All arenas of life have such norms
- Information norms depend on context
- 2 types of info norms
  - Norms of appropriateness
  - Norms of flow/distribution
- Contextual integrity – upholding norms
What is the value of privacy?

- Utilitarian
  - Privacy as individual right
  - Indiv and social interests in opposition

- Pragmatism
  - value of protecting individual is a social one
    (Dewey: civil liberties are socially based and socially justified)
  - privacy not an external restraint on society, but an internal dimension of society; it protects the individual for the sake of society
  - Your privacy is beneficial to me
Experimental studies asking users of mobile devices to share various info about location, personal traits, activities like steps and calories.

Many more willing to share height than weight.

Differences between defined set of friends/contacts and “social network” or public.

Aarathi’s findings: willing to share weight and health goals with even family and friends less often than activity tracking data.

Surprising, sometimes more willing to share that kind of info with specific third parties who requested info for specific purposes – so either thought beneficial or not. And whether relevant (e.g., students sharing “major” with 3rd parties)

Also, lots of work demonstrating that the existence of privacy policy does influence extent of sharing
“We are not detectives ... All we assemble is what is publicly available on the Internet today.”

“Very few people would bother” jumping through such hoops on their own... It’s purposely made difficult for a person with a full-time job and other things to do.”
“Some people... just refuse to participate, including people who have given it a try.”

Beyond Privacy

What happens if
• you can’t opt-out?
• Or be anonymous?
  – Privacy enhancing behaviors

Home Shopping Network uses voice technology to identify frequent shoppers