Chapter 12: Computers In Polite Society: Social Implications of IT

Fluency with Information Technology
Third Edition

by
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Chapter 12: Computers In Polite Society: Social Implications of IT

Improving the Effectiveness of Email

• Problems with email:
  – Conveying emotion
  – Emphasis
  – Conversational pace
  – Ambiguity
  – Flame-a-thons

Conveying Emotion

• Difficult to convey subtle emotions using email
  – Medium is too informal, impersonal, and casually written
  – Conversational cues are missing
• Emoticons are popular
  – Tags a sentence indicating the emotion we mean to communicate
  – :-)
Flames

- Flame is slang for inflammatory email
- Flame-a-thon is ongoing exchange of angry emails
- When angered by email, it's best to delay answering until you cool down

Netiquette

- Rules to promote civilized email usage
  - Ask about one topic at a time
  - Include context (include the question with your answer)
  - Use an automated reply if unable to answer mail for a period of time
  - Answer a backlog of emails in reverse order
  - Get the sender's permission before forwarding email
  - Use targeted distribution lists (don't send the latest joke to every person you've ever exchanged mail with)

Expect the Unexpected

- Suppose a Mailing List Handler Has a Bug
  - Unsubscribe messages start getting sent to everyone on the list, for some reason
    - Someone on the list complains about getting the unsubscribe message
    - Someone else mails back that the list is obviously broken, stop complaining
    - People should notice there's a problem and stop traffic on the list until it's fixed
  - Be alert to unusual event and then think about them

Creating Good Passwords

- The Role of Passwords
  - To limit computer or system access to only those who know a sequence of keyboard characters
- Breaking into a Computer without a Password
  - Trying all possible passwords algorithmically would eventually find correct password, but software usually limits the number of tries
- Forgetting a Password
  - Passwords are scrambled or encrypted and stored, so system administrator usually can't tell you your password if you forget it

Guidelines for Selecting a Password

- It's not a good idea to choose something easily guessed, but should be easy for you to remember
- Should have at least 6-8 characters
- Mix of uppercase and lowercase letters, numbers, punctuation characters
- Sequence not found in dictionaries
- No personal association (like your name)

Heuristics for picking a password

- Select a personally interesting topic
  - Always select passwords related to topic
- Develop a password from a phrase rather than a single word
- Encode the password phrase
  - Make it short by abbreviating, replace letters and syllables with alternate characters or spellings
Changing Passwords

- Should be changed periodically
- Managing Passwords
  - Using a single password for everything is risky; using a different password for everything is hard to remember
  - Passwords can be recycled
    - Make slight changes to good passwords or
    - Rotate passwords

Viruses and Worms

- It’s a Zoo Out There
  - Virus is a program that “infects” another program by embedding a copy of itself. When the infected program runs, the virus copies itself and infects other programs
  - Worm is an independent program that copies itself across network connections
  - Trojan is a program that hides inside another useful program, and performs secret operations
    - May record keystrokes or other sensitive data, or load malicious software
- Exploit is a program that takes advantage of security hole
  - Backdoor access enters computer and reconfigures it for remote control

How to “Catch” a Virus

- Email attachments. Do not open attachments before checking
  - Is this email from someone I know?
  - Is the message a sensible follow-up to the last message from the sender?
  - Is the content of the message something the sender would say to me?
  - Is there a reason for the sender to include an attachment?
- When in doubt, be cautious

How to “Catch” a Virus (cont’d)

- Copying software from infected computer
- Peer-to-Peer Exchange
  - Downloading files from unreliable sources
- New Software
  - Any software is a potential source of infected code
  - Most software distributors are careful to avoid infection

Virus-Checking Software

- Three companies are McAfee, Norton, and Sophos, Inc.
- Programs check for known viruses, worms, etc.
- New viruses are created all the time, so update often

Phishing

- Password harvesting fishing
- Users are sent SPAM emails asking for credit card or banking information
- Message is disguised to appear to be from a bank or business
  - Often reports a security problem the user needs to address
  - When the user clicks legitimate looking link, they are linked to bogus sites set up to steal the information entered
What Can Be Done About Phishing?

- Never respond to requests for personal information like passwords via email; legitimate businesses do not request information this way.
- Do not click on links or pre-typed addresses because they can be spoofed; type the URL yourself.
- Check to make sure the website is using encryption.
- Routinely review credit card and bank statements for unusual activity.
- Report suspected abuses to proper authorities.

Protecting Intellectual Property

- **Intellectual property** is any human creation like photograph, music, textbooks, cartoons, etc.
- Licensing of software:
  - You don’t buy software; you lease it.
  - License gives you the right to use personally, but not sell or give away.
- Try before you buy:
  - Shareware allows you to download and try software for free, then pay the person who built it if you like it (honor system).

Open Source Software

- Software for which the program is publicly available:
  - Mozilla Firefox
- Who pays for the technology and how do companies make money:
  - Selling specialized corporate versions, providing customer support, selling other related software.
- Open source software is worked on and improved by many others.

Copyright on the Web

- A person automatically owns copyright of what he creates in the U.S. and most nations.
- Copyright protects owner's right to:
  - Make a copy of the work.
  - Use a work as the basis for a new work (derivative work).
  - Distribute or publish the work, including electronically.
  - Publicly perform the work.
  - Publicly display the work.

Copyright on the Web (cont'd)

- **Free Personal Use**:
  - You are free to read, view or listen to protected work.
- When is permission needed?
  - Information placed in public domain is free for anyone to use.
  - Otherwise you must get permission from owner.

Copyright on the Web (cont'd)

- The Concept of Fair Use:
  - Allows use of copyrighted material for educational or scholarly purposes, to allow limited quotation for review or criticism, to permit parody.
- When Is It Fair Use?
  - What is the planned use?
  - What is the nature of the work in which the material is to be used?
  - How much of the work will be used?
  - What effect would this use have on the market for the work, if the use were widespread?
Copyright on the Web (cont'd)

- Violating the Copyright Law
  - You break the law whether you give away copyrighted material or sell it
  - Commercial use usually results in higher fines

Ensuring the Reliability of Software

- Safety-Critical Applications (systems that support life or control hazardous devices or materials)
  - Hardware failures can be avoided or resolved using redundancy
    - Have three computers perform all computations of safety-critical system
  - Burn-in
    - Most errors show up after a few hours of operation

Software Failures

- How can programmers be sure their programs work correctly?
  - All reachable configurations (states the software can get into), cannot be examined for correctness—there are too many
  - A program is said to be correct if its behavior exactly matches its specification
  - What can we do about the fact that we can’t prove correctness?

The Challenge

- Accept that software may contain bugs. Monitor usage, be alert to unusual behavior, and be prepared to limit the harm they can do
- Demand high-quality software, refuse buggy software, and be prepared to change to better software

Fail-Soft and Fail-Safe Software

- Fail-soft means the program continues to operate under stress, providing a possibly degraded level of functionality
- Fail-safe means the system stops functioning to avoid causing harm
- Perfectly safe software is just as impossible as perfectly correct software; there is always a risk

<table>
<thead>
<tr>
<th>Table 12.1 Variations of the Melissa virus email</th>
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<tbody>
<tr>
<td><strong>Melissa</strong></td>
</tr>
<tr>
<td>Question for you?</td>
</tr>
<tr>
<td>Check this!!</td>
</tr>
<tr>
<td>Cool Web Sites</td>
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<tr>
<td>IllWeb Free Space</td>
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<tr>
<td>Cheap Software</td>
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<tr>
<td>Cheap Hardware</td>
</tr>
<tr>
<td>Free Music</td>
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<tr>
<td>* Free Downloads</td>
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<tr>
<td>* A randomly selected digit</td>
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