Terms of Endearment

INFO/CSE 100, Autumn 2004
Fluency in Information Technology

http://www.cs.washington.edu/100

Readings and References

- Reading
  - » *Fluency with Information Technology*
    - Chapter 1, Terms of Endearment

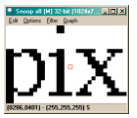
Le Mot Juste

- Learning *le mot juste*, the right word for something, aids us in two ways:
  - » Helps our learning ... our brains seem to anchor concepts to words and phrases
  - » Helps us when getting help ... asking "tech support" for help or using online HELP requires us to describe the problem precisely

mot juste/mō zhüst/ (Fr.) most appropriate word, expression

Terms

- Possibly familiar terms …
  - » screen saver
  - » monitor
  - » pixel
  - » RGB
  - » motherboard
  - » [micro] processor
  - » [RAM] memory



Software/Hardware

- Hardware refers to physical devices
- Software refers to programs
  - » the instructions directing a computer
- The main difference is: hardware cannot be changed, while the software can be modified
  - » The same computer hardware often runs many different software applications
  - » The same software application can often run on several different (but similar) computers

Terms

- Definitions for information technology terms like byte, pixel, etc, are found in glossaries
  - » There is a glossary in the back of the text book
  - » Online glossaries are handy …
  - » A useful study aid is to start a document where you store the definitions of the new words you encounter -- later in the term we will show how to set up a database for them
  - » Use Google with define: <term>

Terms

- Understanding the "tangible" parts of IT is important
  - » system board, CPU, memory, disk, ...
- Understanding the "intangible" parts of IT is important too
  - » algorithm, abstraction, generalization, interface, user model (eg, deadbolt example in the book)

To Abstract

- abstract = extract or remove something
  - » In FIT100 abstracting will usually involve removing the core idea or process from a specific situation -- fable with a moral
    - The "thing removed" is an abstraction
  - » Humans abstract core ideas, principles, rules, themes, etc. naturally

Imagine a Story ...

- The story: “In Kim’s chemistry class the professor assigned challenge problems worth extra credit, but each week Kim couldn’t do them and asked for help. The teacher said, ‘Don’t give up, attempt the problem again the next day.’ Kim followed the advice and was eventually able to solve the problems.”
- The moral of the story: A good problem-solving technique is to return later to a problem.
  - » Some aspects of the original story are relevant
  - » Some aspects are irrelevant

To Generalize

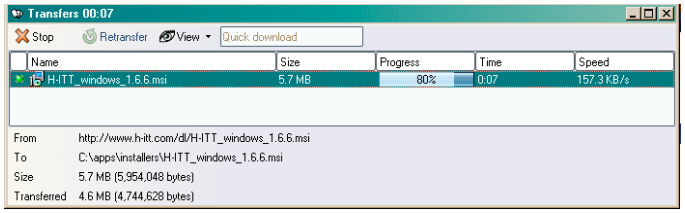
- generalize = infer a rule that applies in many situations
  - » suppose you notice that a faucet works like this
    - turn counter-clockwise to turn the water on
    - turn clockwise to turn the water off
  - » to infer that all faucets do so is to generalize

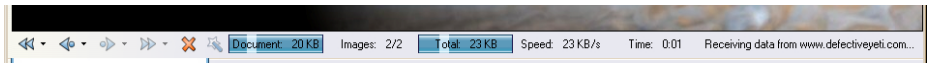
To Generalize

- Can we generalize further?
  - » twisting lids, caps, screws, counter-clockwise usually "opens" or "loosens" them
  - » volume knobs usually work the other way
- Can we create an abstraction from this?
  - » A twisting motion is often used as an "on or off", "more or less", control gesture but the correct direction is not always obvious unless there are other clues

Operationally Attuned

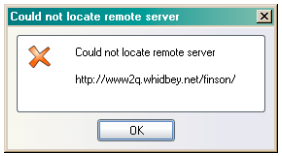
- Noticing how devices operate simplifies their use
  - » Observation: Computer programs often give feedback when they are working





Operationally Attuned

- Noticing how devices operate simplifies their use
  - » Observation: Computer programs often give feedback when they are working
  - » So, if you think you're waiting for the computer but there is no indication that it's working, it's probably waiting for you
- Look around the screen
  - » Is there an input dialog box?
  - » Is there an error message that you need to okay?



The Speed of Change

- Consider running a mile …
  - » How fast can anyone run a mile?
    - In 1999 Hakim El Guerrouj ran it in 3:43.13
    - a rate of $3600\frac{seconds}{hour}\cdot\frac{1}{223.13}\frac{miles}{seconds}\cong 16.134\frac{miles}{hour}$
  - » Compare with Roger Bannister
    - In 1954 Bannister ran a mile in 3.59.4
    - a rate of 15.038 mph
- In 45 years the top runners got 7% faster

$$\frac{16.134-15.038}{15.038}\cong 0.07$$

A Speed Comparison

- Compared to normal people ...
  - » How fast can you run a mile?
    - El Guerrouj ran it in 3:43.13 (or 16.134 mph)
    - Healthy people in their twenties run it ~7:30 (or 8 mph)
  - » That is, El Guerrouj is twice as fast as you
- El Guerrouj is about a factor-of-2 faster than normal people ...

A factor-of-2 is a good rule for human strength

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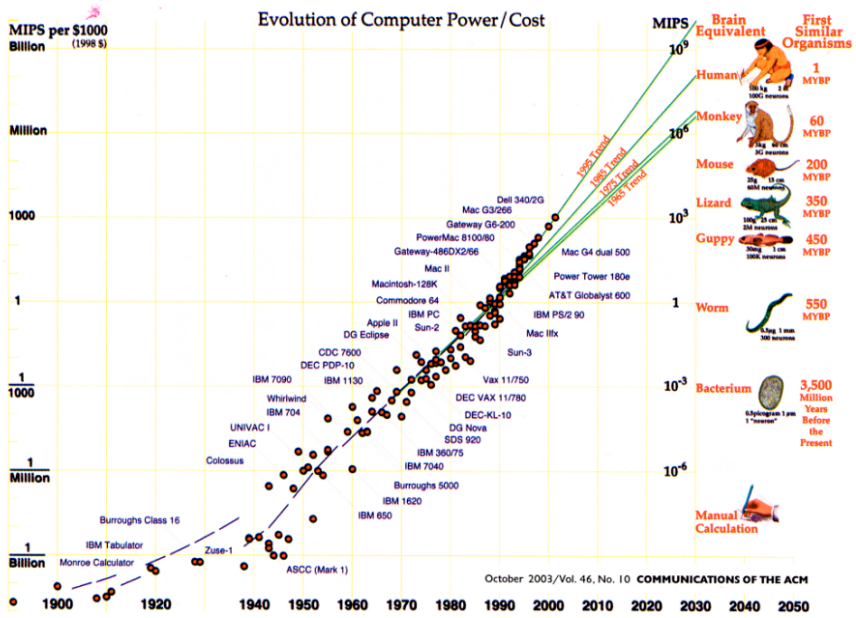
- Can we comprehend such speeds or factors of improvement???

N, N, power(2,N) Excel demo

Recall our chart from last time about computer power ...



Factors

- The factor of improvement is related to the percent improvement …
  - factor = new_rate/old_rate
  - percent = 100 x (new_rate-old_rate)/old_rate
- Expressing an improvement by its factor is easier, esp. for large changes
  - El Guerrouj's 7% improvement over Bannister is a 1.07 factor of improvement

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  - The time for the mile run has improved
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Getting information is easy with IT, but we need analysis to understand the significance

Summarizing

- It is essential to learn the vocabulary of a new field
  - » Words of tangible aspects of IT have definitions in glossaries
  - » Words for the intangible are key
    - Abstract
    - Generalize
    - Operationally Attuned
  - » Being analytical is key to understanding