Terms of Endearment

FIT 100, Spring 2005
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 like to connect concepts to words and phrases
  - Helps us to communicate with others … asking "tech support" for help or using online HELP requires us to describe the problem precisely
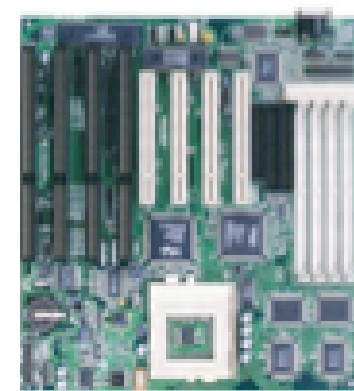
Not Another Term?!?

- Blog (from weblog)
- Pod-casting (from broadcasting)
- Geocaching

Terms

- Possibly familiar terms….
  - monitor
  - screen saver
  - CRT vs LCD
  - Pixel (1024X768)
  - RGB
  - motherboard
  - daughterboards/cards

Terms con'd

– CPU (central processing unit)

– [micro] processor

– memory

» ROM

» RAM (volatile)

» hard disk /hard drive

Hardware/Software

- Hardware refers to the physical devices
- Software refers to the programs
  - The *instructions* for directing a computer
- The main difference is that hardware cannot be changed, while 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

More 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 also handy …

  – A useful study aid is to start your own glossary, write down the definitions of the new words that you encounter

  – Use Google with define: <term>

More Terms con'd

- Understanding the "tangible" parts of IT is important

  – system board, CPU, memory, disk, etc…

- Understanding the "intangible" parts of IT is important too!

  – algorithm, abstraction, generalization, interface, user model (eg. deadbolt example in the book)

An Algorithm

- algorithm = is a precise and system method for solving a problem
  - Writing out the steps of an algorithm is *programming*
    - » We as a computer to *run* a program
    - » A computer *executes* a program when it performs instructions

To Abstract

- abstract = to extract or remove something

  – In FIT100 abstracting will usually involve removing the core idea or process from a specific situation (eg. A fable with a moral)

    » The "thing removed" is an abstraction

  – Humans abstract core ideas, principles, rules, themes, etc… naturally

Imagine A Story…

- The fable of the boy who cried wolf…
  - Shepherd boy was tending his flock of sheep
  - He was lonely, so decided to cry out to the villagers, "wolf, wolf"
  - The villagers came running to his aid, and were very disappointed when they discovered no wolf!
  - Then one day a wolf did actually come and when the boy called out to the villagers, no one came
    - » Moral: no one believes a liar, even one who speaks the truth

To Generalize

- generalize = infer a rule that applies in many situations

  – Suppose you notice that a faucet works like this:

    » Turn counter-clockwise (left) to turn the water on

    » Turn clockwise (right) to turn the water off

 – To infer that all faucets work the same way is to generalize

To Generalize con'd

- Can we generalize further?
  - Twisting lids, caps and 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 an off", more or less, a 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
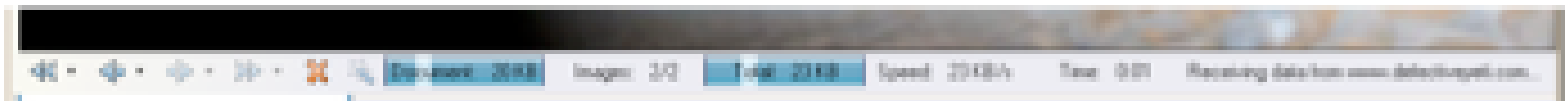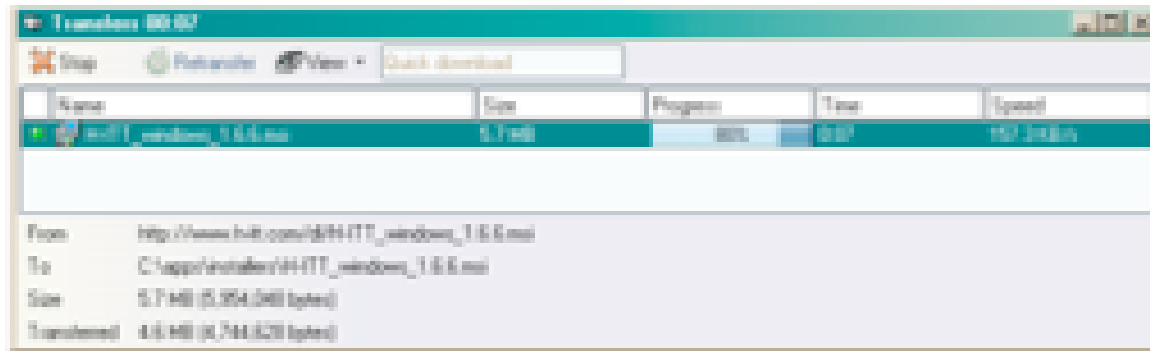
Operationally Attuned con'd

- Noticing how devices operate simplifies their use
  - Observation: computer programs often give feedback when they are not working
  - So, if you think you're waiting for the computer but there is no indication that its working, its probably waiting for you!

- Look around the screen
  - Is there an input dialog box?
  - Is there an error message that you need to ok?
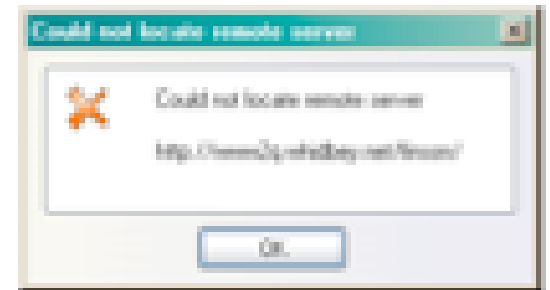
Analytical Thinking

- Allows us to talk about changes in a meaningful way
  - By giving facts as a measure of performance
- We can compare changes to other changes

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 16.134 mph
    - Compare that 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 go 7% faster

    new rate - old rate / old rate = percent improvement

A Speed Comparison

- Compared to normal people…
  - How fast can you run the mile?
    » El Guerrouj ran it in 3.43.13 (16.134mph)
    » Health people in their 20s run in ~7.30 (8mph)
  - That is, El Geurrouj is twice as fast as you

- El Guerrouj is about a factor-of-2 faster than normal people …

  new rate / old rate = factor of improvement

One More Factor

- How fast do computers run?
  - Univac I ran 100,000 adds(+)/sec in 1954
  - ASCI Red ran 2.1 trillion adds/sec in 1999

(new rate/ old rate = factor of improvement)

2.1 trillion / 100,000 = a factor of 21 million times faster!

Summary

- We reviewed a lot of terms (and more terms!)

- Talked about where to learn more about new terms

- Discussed why its good to be operationally attuned

- Learned how to calculate factors, which we can use to compare changes

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