Session   Background
Topic: Computer Information Systems

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What is a "system"?

- Takes stuff in
- Does something (preferably something useful)
- Spits stuff out
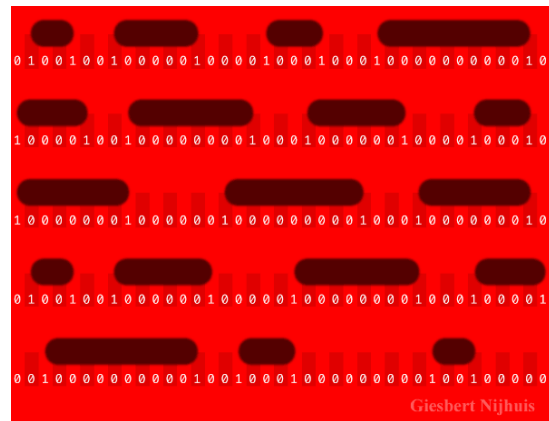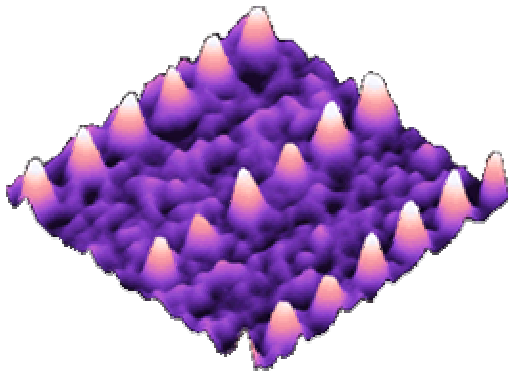
Everything is essentially a system

Systems

A Computer is a System
- Operates solely on switches
- Represent a switch with a "bit" (0 or 1)
- Computers do math on switches very fast
- Bits go in, bits go out

    1   0   1   (Three bits = 8 possible combinations)
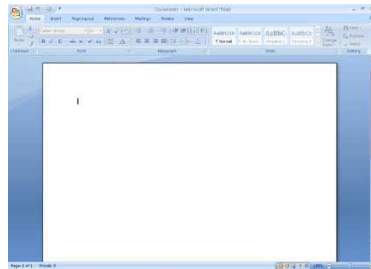   (on   off   on)

Information is stored in bits
- Magnetic Field (Hard Drives)
- Laser Reflection (CD, DVD)
- Electrical (USB stick sort of, technically Fowler-Nordheim tunneling)

But I don't see bits?

- Combinations of bits (switches) represent some information
- "Digitization" is the process of taking some thing and coming up with bits to represent it
- Everything computer uses somehow represents bits
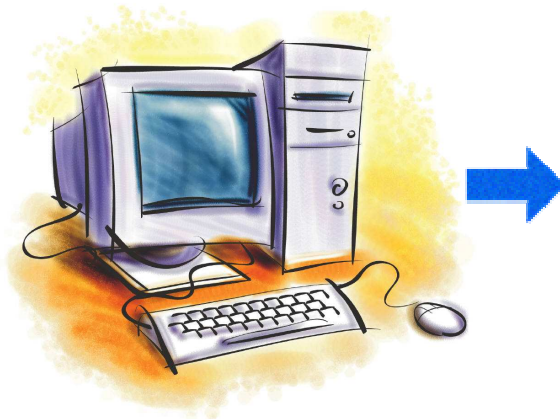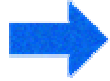- Everything that comes out converts bits into something we understand

00101010
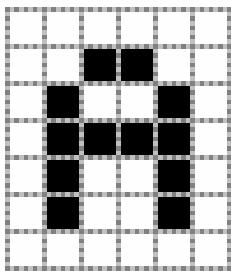10110101
11000101
01000111

Binary Numbering
A system for representing decimal numbers using bits

Computer System

A bunch of switches could represent…


```
0 0 0 0 0 0
0 0 1 1 0 0
0 1 0 0 1 0
0 1 1 1 1 0
0 1 0 0 1 0
0 1 0 0 1 0
0 0 0 0 0 0
```

Business Organizations are also Systems
- Traditionally inputs are raw materials
- Output is a manufactured product
- Traditionally a "value-adding" system that creates output product with more value than input raw materials
- Customers thus have reason to pay added money for product

Modern Business Organizations
- Actual "raw materials" moving toward information
- Actual "product" moving toward services and information
- Hmmm, computers process information…

Business Operations
- Perform work
- Sell product ← "Transactions"
- Make decisions (that hopefully aid business operations)

Computer-Based Information Systems
- Systems that process Information using Computers
- There can be information systems that do not use computers
- What kind of CBIS can be used to aid business?

Business Organizations as Systems

Transaction Processing Systems (TPS)

- Handle business transactions (an "exchange)
- Generally involve the business day-to-day operations
- Typically involve Point-of-Sale systems
- Buying goods, selling products, paying employees
- "E-Commerce" describes online handling of transactions
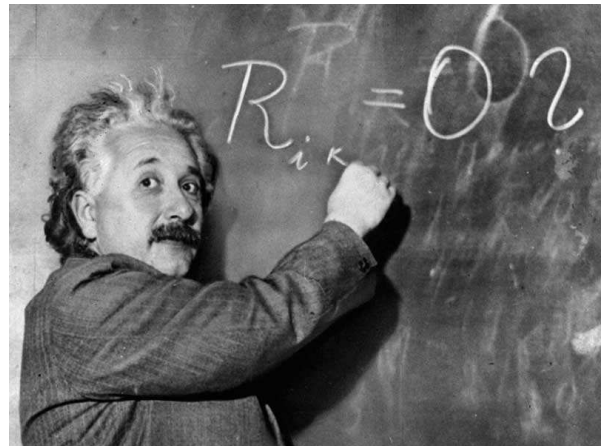
Management Information Systems (MIS)

- Provide information about basic business status
- Usually provide a "report"
  - Current inventory
  - Daily Sales
  - Available courses
- Typically report simple facts on business day-to-day operations (transactions)
- Help with frequent, common decisions
  - When to order more stock
  - Which course to register for

Decision Support Systems (DSS)
- Help with very specific, difficult decisions
- Usually infrequent decisions involving strategy and planning
- Typically involve some processing logic and formulas, as opposed to just simple facts
    - Analyzing store locations and delivery distances to decide where to build a new warehouse
    - Analyzing course availability and prerequisites to design a four-year plan for graduating
- Also Group Decision Support Systems (GDSS)

Expert Systems (ES)
- Attempt to simulate the decision-making process of an expert
- Provides actual decision suggestion
- Typically involves very complex computation
- An expert is someone with specialized, uncommon knowledge about how to solve a problem or accomplish a task
    - Realizing that you have 0 widgets in stock does not require an expert
    - Designing a fuel injector for an automobile requires an expert

How do I figure out what CBIS it is?

Deals with day-to-day transactions?	TPS, MIS
Does it provide reports with simple facts?	MIS
Provides information to help make decisions?	MIS, DSS, ES
Does it use advanced logic and formulas	DSS, ES
Does it help with strategy and long-term planning?	DSS
Does it involve knowledge from an expert?	ES
Does it actually make a decision?	ES

What are the transactions of the business?
- What is the business?
- What do they buy and sell?

Is this a day-to-day decision or a complex decision?
- What does the business do day-to-day?
- Can the decision be made automatically based on information?

Amazon.com

- Allows you to look for specific products
- Allows you to buy products online

Name That System!

FSU Course Lookup

- Allows you to look for specific classes
- Allow you to determine class offerings and times

Google

- Allows you to find web page addresses based on search terms

Undergraduate Advisor

- Provides bulletin information about required courses
- Provides information about prerequisites

Mycin

- Uses information from medical doctors
- Takes information about hospital patient vital signs and diagnostics
- Diagnoses infectious blood diseases and recommends antibiotics