Human-Computer Interaction

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The Human, Computer and Interaction

- What's good about the design of this error box?

- What's poor about the design of this error box?

- Whose fault is this?

Invalid Login Credentials
Please wait 2 seconds to login again.

Student Login

Username
sdfsdf

Password
your password

Login

- Design an Error message box for this case

Did your design support?

- A customer who can't read English?
- A customer who is hearing impaired?
- A customer who has never seen X as indication of error before?
- A customer who loves/hates red color?
- A customer who has an IQ of less than 80?
- Did you design an interface for you?
- Is not that what someone already did?

Definition of HCI

- "Human-computer interaction is a discipline concerned with the ***design, evaluation*** and ***implementation*** of *interactive computing systems* for ***human use*** and with the study of *major phenomena* surrounding them."

  - ACM SIGCHI Curricula for HCI (Hewett et al. 1992) http://sigchi.org/cdg/cdg2.html

HCl consists of three parts:

- **Human**: could be an individual user or a group of users.

- **Computer**: could be any technology ranging from the general desktop computer to a large scale computer system.

- **Interaction**: any direct or indirect communication between a human and computer.

Humans, Computer and Interaction

The H	Humans good at: Sensing low level stimuli, pattern recognition,inductive reasoning, multiple strategies, adapting "Hard and fuzzy things".
The C	Computers good at: Counting and measuring, accurate storage and recall, rapid and consistent responses, data processing/calculation, repetitive actions, performance over time, "Simple and sharply defined things".
The I	The list of skills is somewhat complementary. Let humans do what humans do best and computers do what computers do best.

The HCI Challenge

HCI
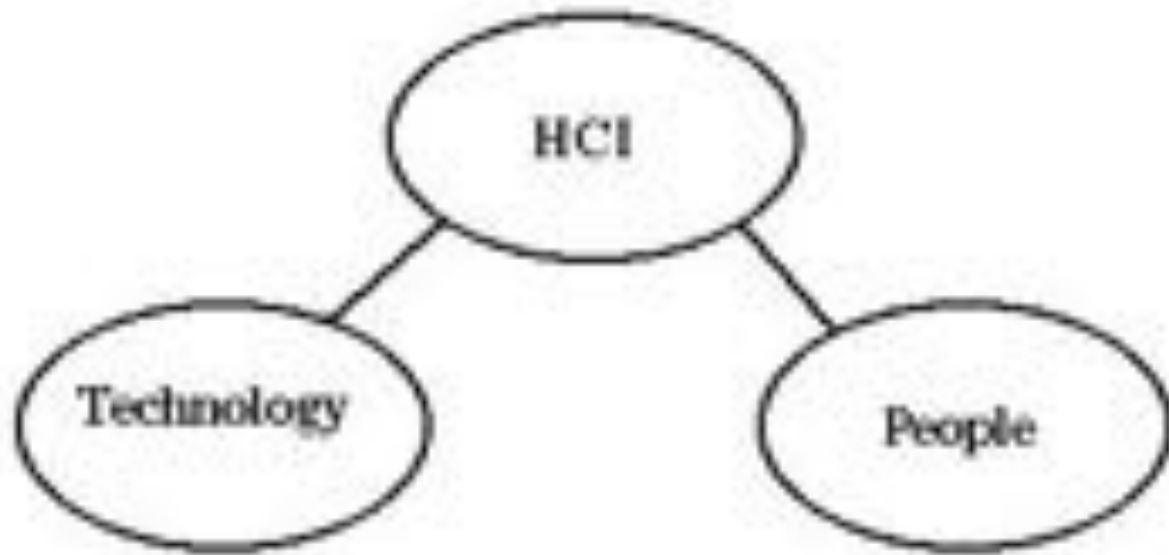
Technology

People

What can it do?
How can it be built?
What are the possibilities?

What are people doing?
How would it fit it?
What would they do with the technology?

Topics in HCI
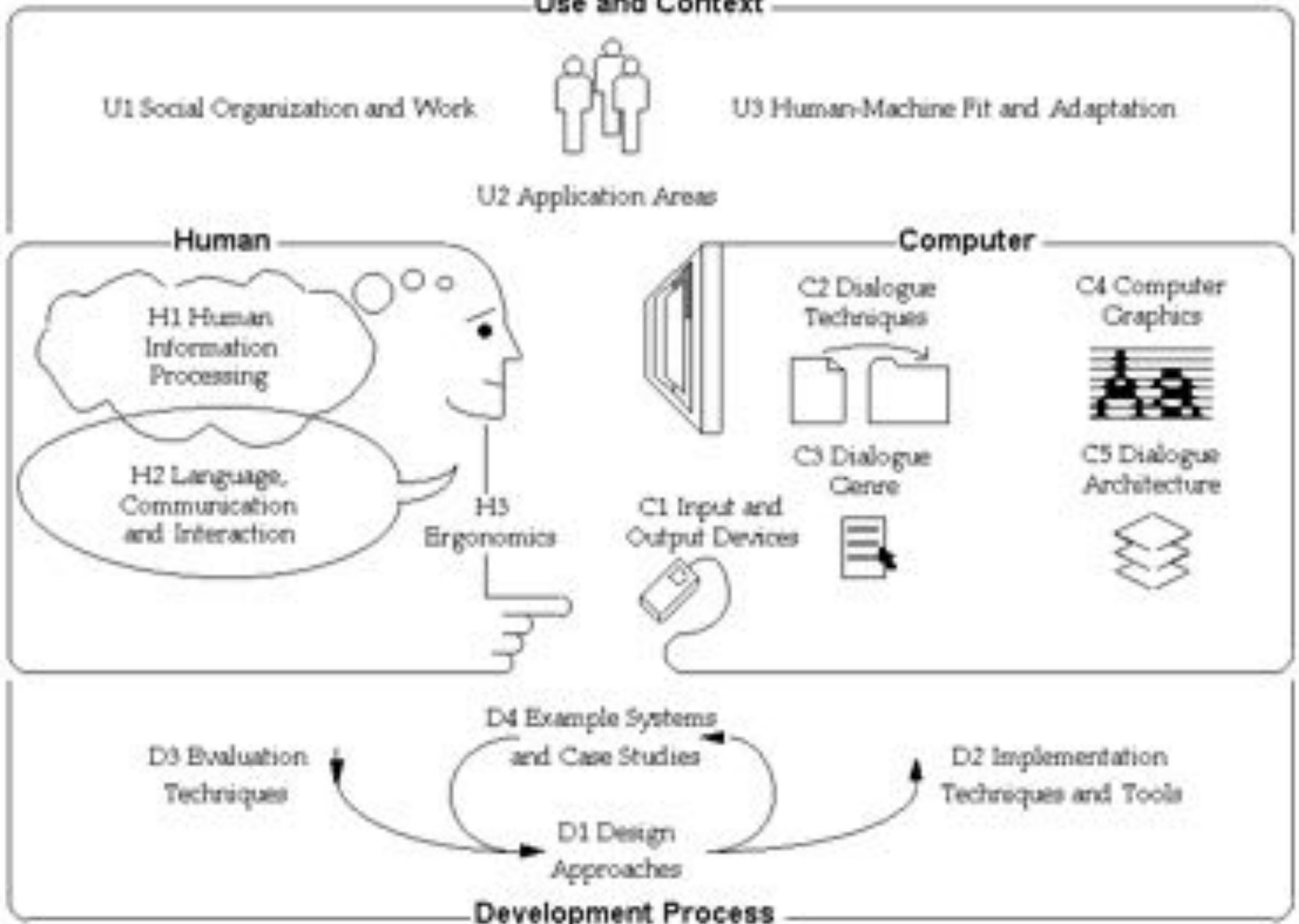
Why HCI is Important

- Define the best interface that you have experience of?
  - Effectiveness
  - Productivity
  - Morale
  - Safety

- Activity: which mobile device you have?
  - How would you describe the interface?
  - How would you describe the product to your friend?
  - Would you buy the product again?
  - Would you buy a product from the same company again?

HCI is **Not** about

- Making the interface look pretty

- Only about desktop computers (and that goes for computing as well!)

- Something that would be nice to do but usually there's no time for it

HCI is about

- Understanding the users
- Understanding users tasks
- Understanding the surrounding environment
- GUI requirements gathering and analysis
- Design prototype
- Evaluate the system

The goals of HCI

- **The goal of HCI** *"is to develop or improve the safety, utility, effectiveness, efficiency and usability of system that include computers."*

  (Interacting with computers, 1989, p3)

The goals of HCI

- The goals of HCI are to produce usable and safe systems, as well as functional systems. In order to fulfill that, developers must attempt to:
  - Understand how people use technology
  - Building suitable systems
  - Achieve efficient, effective, and safe interaction
  - **Put people first**

    People needs, capabilities and preferences should come first. People should not have to change the way that they use a system. Instead, the system should be designed to match their requirements

Why HCI is Important in the Context of WWW?

- Competition is very close (just another link…)
- Comparison is easily possible (example – Online-Shop)
- Users who can't find the product in the shop can not buy it
- Users who are not able to fill in correctly the order form are not going to buy

It is not **Simple** to Make Good User Interfaces

Basic misconceptions:

- If I (the developer) can use it, everyone can use it

- If our non-technical staff can use it, everyone can

- Good user interfaces are applied common sense

- A system is usable if all style guidelines are met

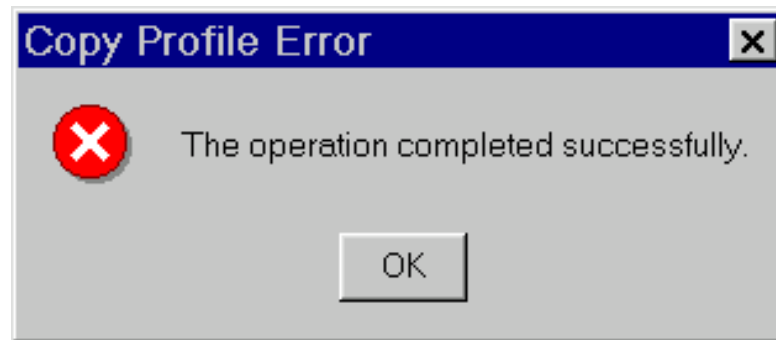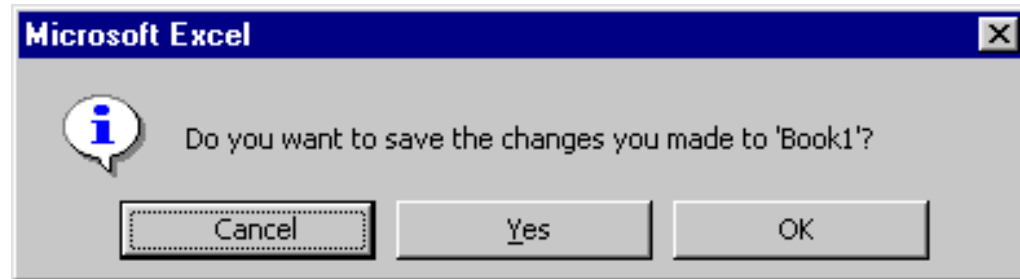# Examples of good and bad design

Examples ..(cont.)

8) Age:

9) ☑ Female
☑ Male

Examples ..(cont.)

Copy Profile Error

The operation completed successfully.

OK

Examples ..(cont.)

Microsoft Excel

ℹ Do you want to save the changes you made to 'Book1'?

[Cancel]   [Yes]   [OK]

Examples ..(cont.)

Web Images Videos Maps News Shopping Gmail more ▼

Google translate

From: Arabic ▼ ⬚ To: Arabic ▼ [Translate]

☑ Allow phonetic typing ⑦

Google Translate for my: 🔍 Searches 📹 Videos ✉ Email 📱 Phone 💬 Chat 💼 Business

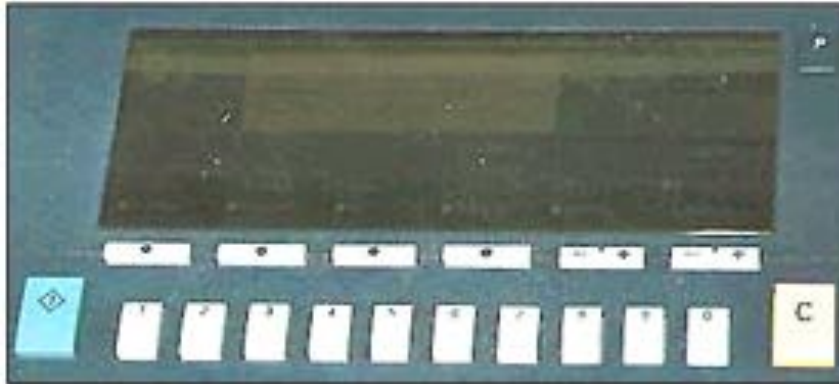About Google Translate   Turn off instant translation   Privacy   Help
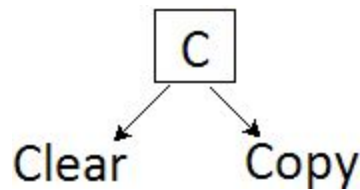
Examples ..(cont.)

Designer vs. Users

Making a photocopy
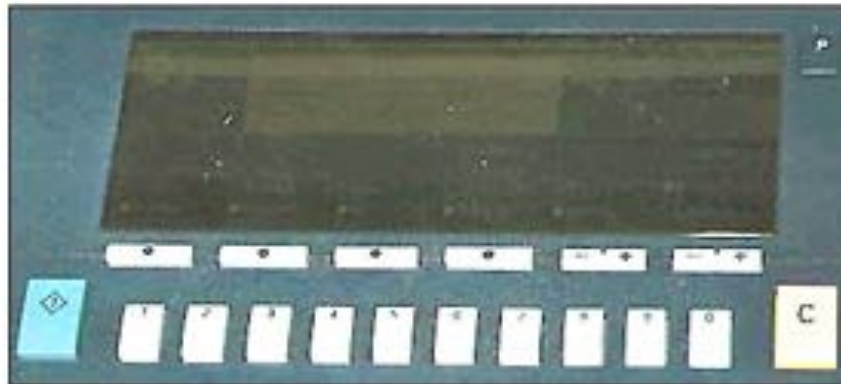

- Why this photocopier does not work? What do you think!

Designer vs. Users

C → Clear
C → Copy

Designer meant by 'C' = Clear   People thought that 'C' = Copy

Examples ..(cont.)

Enter your Social Security Number:

Select your State

- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- Florida
- Georgia
- Kansas
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri

Examples ..(cont.)

Enter your Social Security Number:
0 ▼ 0 ▼ 0 ▼ - 0 ▼ 0 ▼ - 0 ▼ 0 ▼ 0 ▼ 0 ▼

Select your State

○ Alabama   ○ Kansas
○ Alaska   ○ Kentucky
○ Arizona   ○ Maine
○ Arkansas   ○ Maryland
○ California   ○ Massachuset
○ Colorado   ○ Michigan
○ Connecticut   ○ Minnesota
○ Delaware   ○ Mississippi
○ Florida   ○ Missouri
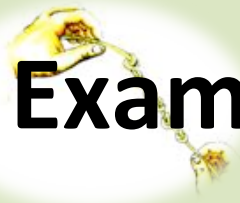○ Georgia

Examples ..(cont.)

Examples ..(cont.)

Visibility and Affordance

Visibility – what is seen

Affordance – what operations and manipulation can be done to a particular object

What is visible must have a good mapping to their effect

Perceived affordance – what a person thinks can be done to the object

Is HCI really Important?

Time to Think!

- What is the percentage of software development projects that fails?
- A. 20%
- B. 35%
- C. 55%
- D. 85%

Why Do IT Projects Fail?

- Project success:
  - On time?
  - Within budget?
  - Has all planned features and functionalities?
- The CHAOS studies also provides some insight as to the factors that influence project success/failure

Summary of Factor Rankings for Challenged and Failed (Impaired) Projects
Source: Adapted from the Standish Group. CHAOS (West Yarmouth, MA: 1995)

Rank	Factors for Challenged Projects	Factors for Failed (Impaired) Projects
1	Lack of user input	Incomplete requirements
2	Incomplete requirements	Lack of user involvement
3	Changing requirements & specifications	Lack of resources
4	Lack of executive support	Unrealistic expectations
5	Technology incompetence	Lack of executive support
6	Lack of resources	Changing requirements & specifications
7	Unrealistic expectations	Lack of planning
8	Unclear objectives	Didn't need it any longer
9	Unrealistic time frames	Lack of IT management
10	New technology	Technology illiteracy

The Software Crisis

- The CHAOS study published in 2009 by The Standish Group found that although the U.S spent over $250 billion on IT projects, approximately…
  - 24% were cancelled before completion
  - 44% were completed but over budget, over schedule, & did not meet original specifications
    - The average cost overruns were 189%!
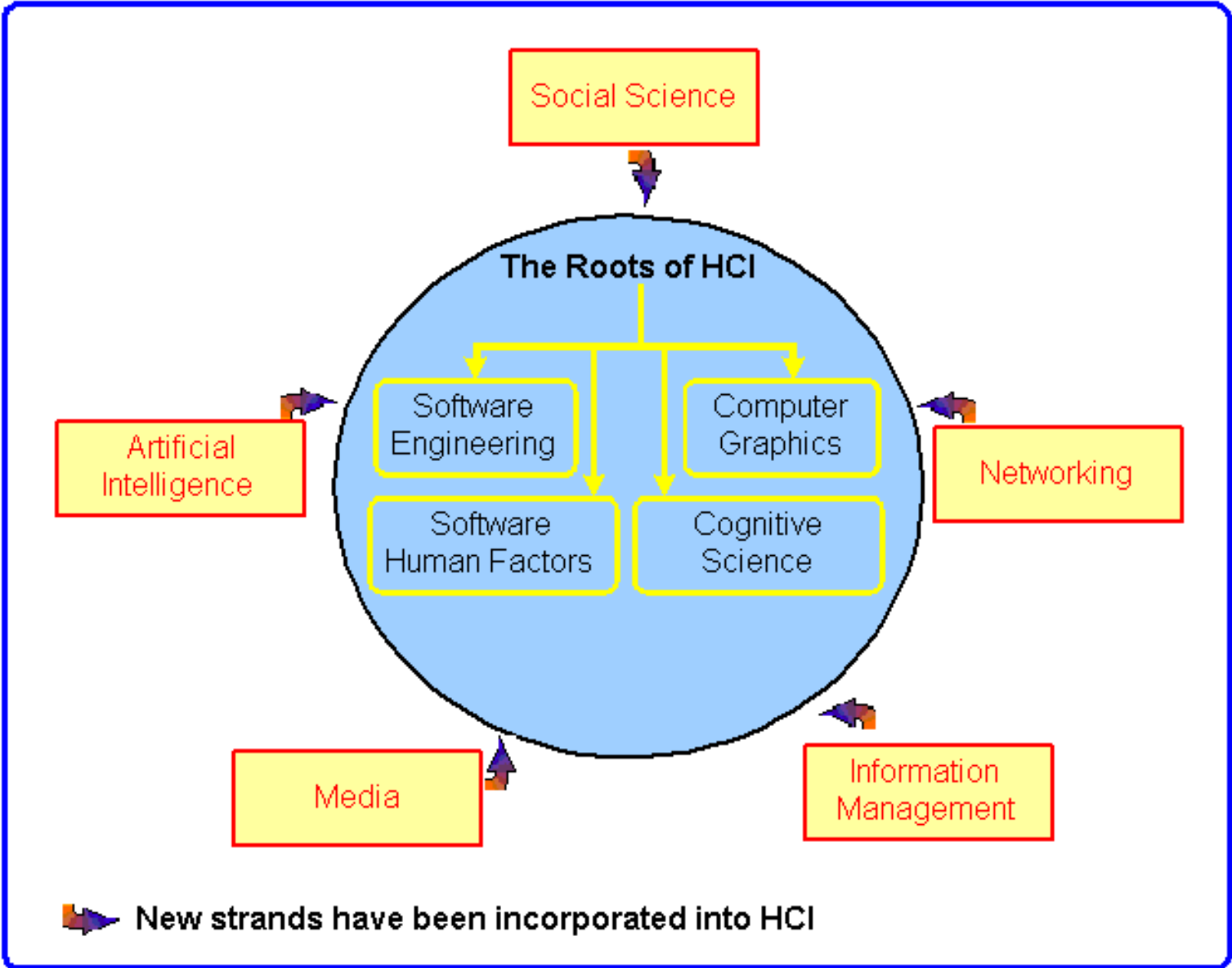
A real life example

Example about: Health and safety concerns
If the video doesn't record a TV
program because we pressed
 the wrong button, we are likely
to feel angry.

A real example: a pilot shuts down the wrong engine and the plane crashes (as happened near Leicestershire, in England on the M1 motorway in 1989), this is obviously more serious. **47 died**

Relationship of HCI to other disciplines

Social Science

The Roots of HCI

Software Engineering

Computer Graphics

Artificial Intelligence

Networking

Software Human Factors

Cognitive Science

Media

Information Management

New strands have been incorporated into HCI

- Questions?

- What is the relationship between **cognitive load** and user interface design?
- From the "Reference Material" on Website (tariqzaman.jimdo.com), download

(Bødker S.,2006); read and prepare one page notes for the discussion in next class