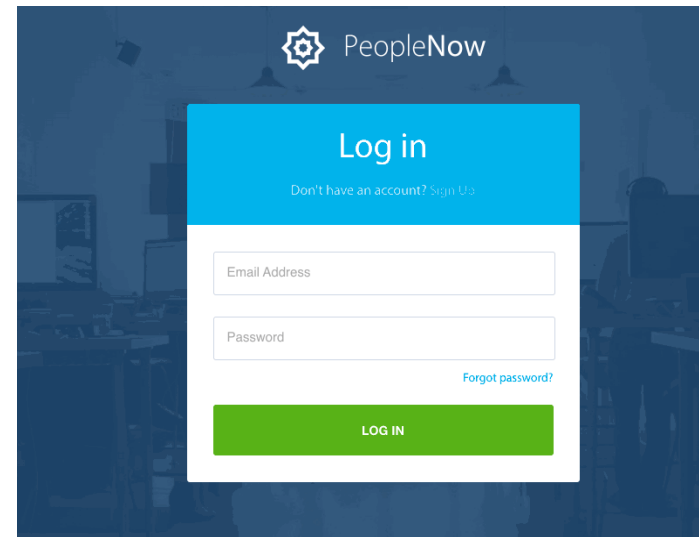


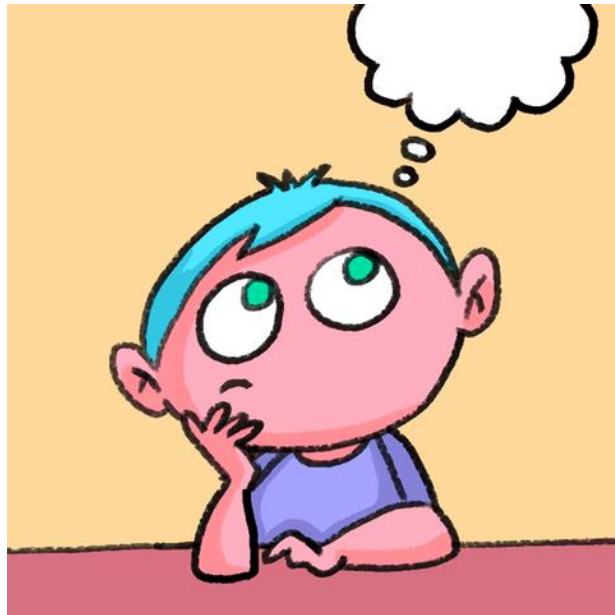


WEEK 2

WHAT IS HCI?



Why do we care about design?





Human Computer Interaction

- **The term HCI was adopted in mid-1980s: Association for Computing Machinery (ACM):** “discipline concerned with the design, evaluation & implementation of interactive computer systems for human use & with the study of major phenomena surrounding them” (1992)
- **Carroll:** “HCI is the study and practice of usability. It is about understanding and creating software and other technology that people will want to use, will be able to use, and will find effective when used.” (2002)

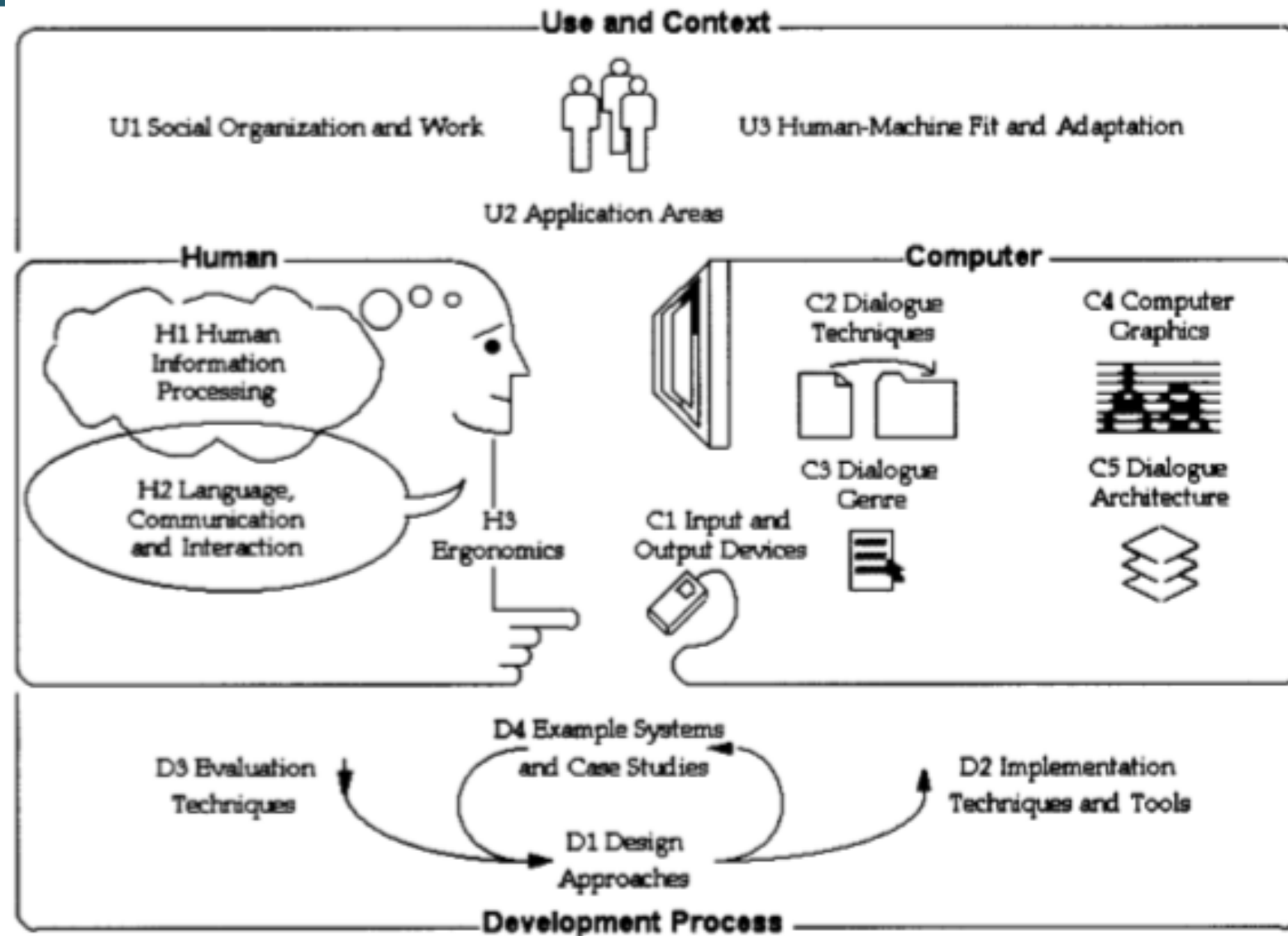
Human Computer Interaction

- **Human:** Individual user, a group of users working together, a sequence of users in an organization
- **Computer:** Desktop computer, large-scale computer system, Pocket PC, embedded system (e.g., photocopier, microwave oven), software (e.g., search engine, word processor)
- **User interface:** Parts of the computer that the user contacts with
- **Interaction:** Usually involve a dialog with feedback & control throughout performing a task (e.g., user invokes “print” command and then interface replies with a dialog box)

HCI Scope

- **Use & Context:** Find application areas for computers
- **Human:** Study psychological & physiological aspects e.g., study how a user learns to use a new product, study human typing speed
- **Computer:** Hardware & software offered e.g., input & output devices, speed, interaction styles, computer graphics
Development: Design, implementation & evaluation

- Computer Science
- Psychology (cognitive)
- Communication
- Education
- Anthropology
- Design (e.g. graphic and industrial)



HCI Goals

- At physical level, HCI concerns the selection of the most appropriate input devices and output devices for a particular interface or task
- Determine the best style of interaction, such as direct manipulation, natural language (speech, written input), WIMP (windows, icons, menus, pointers), etc.
- Develop or improve
 - Safety
 - Utility
 - Effectiveness
 - Efficiency
 - Usability
 - Appeal of systems that include computers

HCI Goals

- Safety: protecting the user from dangerous conditions and undesirable situations
- Users
- Nuclear energy plant or bomb-disposal – operators should interact with computer-based systems remotely
- Medical equipment in intensive care unit (ICU)
- Data
- Prevent user from making serious errors by reducing risk of wrong keys/buttons being mistakenly activated
- Provide user with means of recovering errors
- Ensure privacy (protect personal information such as habits and address) & security (protect sensitive information such as passwords, VISA card numbers)

HCI Goals

- Utility: extent of providing the right kind of functionality so that users can do what they need or want to do
 - High utility
 - *Scientific calculator provides many mathematical operations, built-in formulae, and is programmable
 - Low utility
 - *Software drawing tool does not allow free-hand drawing but supports polygon shape drawing
- Effectiveness: concern a user's ability to accomplish a desired goal or to carry out work
 - Find a master thesis in our library Web

HCI Goals

- Consider the scenario: a shopping Web provides all the information, instruction and server-side support required to perform an on-line purchase. However, the users cannot figure out how to find the items they want to buy.
- Efficiency: a measure of how quickly users can accomplish their goals or finish their work using the system
 - Find a book “human computer interaction” in our library Web How about a master thesis whose author’s last name is “Cheng”? How about the newest book in the subject of “human computer interaction”?

HCI Goals

- Usability: ease of learning and ease of use
 - Can I use the basic functions of a new digital camera without reading the manual? Does the software facilitate us to learn new functions easily?
- Appeal: how well the user likes the system
 - First impression
 - Long-term satisfaction

HCI Goals

Use Microsoft WORD as an example:

Goals	Achieved?	Example
Safety	Yes	Warning for "Exit before Save"
Utility	Yes	A lot of word processing functions is provided
Effectiveness	Yes	A science student can edit equations
Efficiency	Yes	Default template avoids initial document setting
Usability	Yes	Icons help ease of learning
Appeal	Yes	Interface is attractive

HCI Benefits

- Gaining market share
 - People intend to buy/use products with higher usability e.g., Google's search engine has the largest market share because it is easy to use with higher efficiency
 - Improving productivity
 - Employees in a company perform their jobs in a faster manner e.g., Workers in a mainland company needed to press a lengthy sequence of buttons in performing a task. An IAS student helped to increase their productivity via writing a batch program for the button pressing operation e.g., Intranet can increase employees' efficiency

HCI Benefits

- Lowering support costs
 - If the product is not usable, calls to customer support can be enormous e.g., If a washing machine is difficult to use even after reading the instruction manual, many users will call the customer service and the cost per call can be over \$100
- Reducing development cost
 - Avoid implementing features users don't want and creating features that are annoying or inefficient e.g., If there are too many unnecessary confirmation dialog boxes in using a word processor, it is likely this product needs to be redeveloped

Good and Poor Design Examples

- Nokia 6800: Users can write messages with the cover closed, or open the cover to reveal a full keyboard for easy messaging (www.nokia.com)
- Is it a good design?
- Why?



Good and Poor Design Examples

- This is an interface of a dialog box. Is this a good design?



The End.