IE 403/476
Human-Computer Interaction
Week 3-Lec1

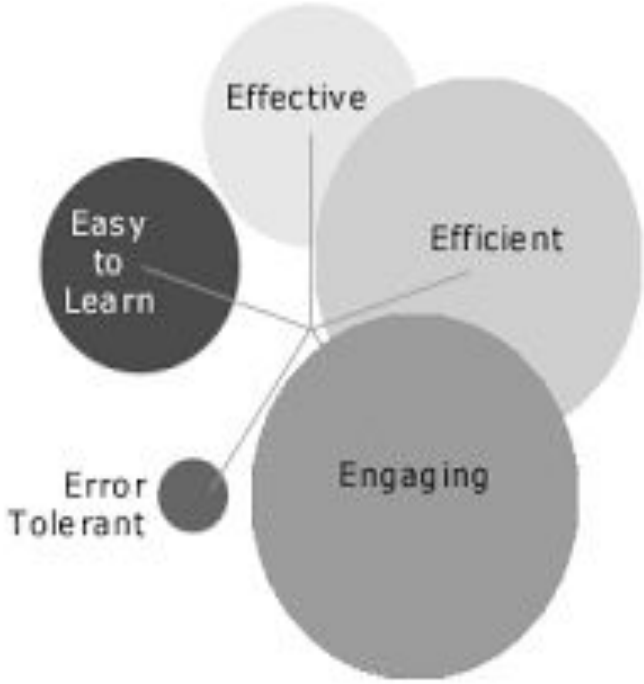
Recap of Usability

Usability

- ISO 9241 defines usability as effectiveness, efficiency and satisfaction with which users accomplish tasks
- The ability of a User to Use the product/ system / environment as desired
- Usability Engineering: The ‘affordance’ offered by a product that makes it useable

Dimensions of Usability

- Learnability: Easy to learn
- Efficiency: Once learned, is it fast to use?
- Errors: Are errors few and recoverable?
- Visibility: Is the state of the system visible‘
- Effectiveness: Can it do the job well and correctly?
- Satisfaction: Is the user happy with the interface?

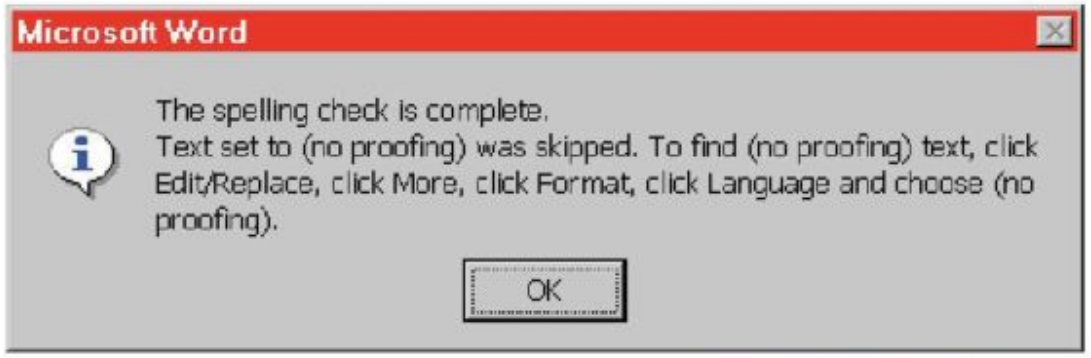


Building all these dimensions into a product is called Usability Engineering

Learnability & Memorability

Learnability and memorability – making interfaces easier for new users to learn, and for casual users to remember.

People Don't Learn Instantly



Source: Interface Hall of Shame

Recognition Vs Recall

Recognition:

- remembering with the help of a clue
  - "using knowledge in or of the world

Recall:

- Remembering with no help
  - "using knowledge in the head"
  - How much do we remember?

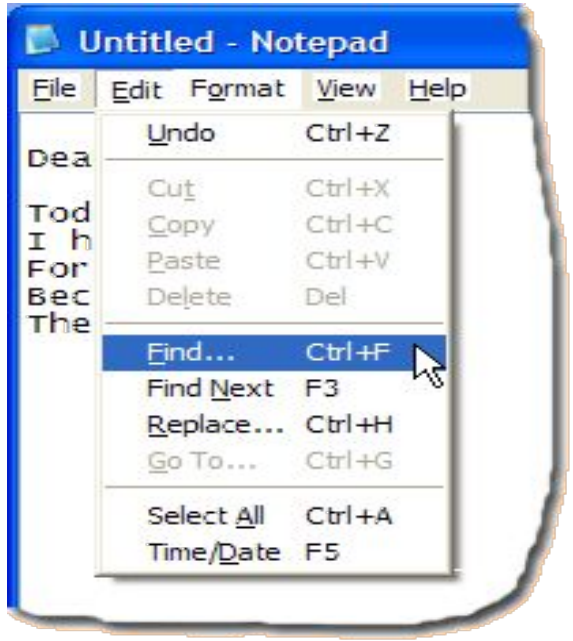


Fig 1: Menu based interfaces

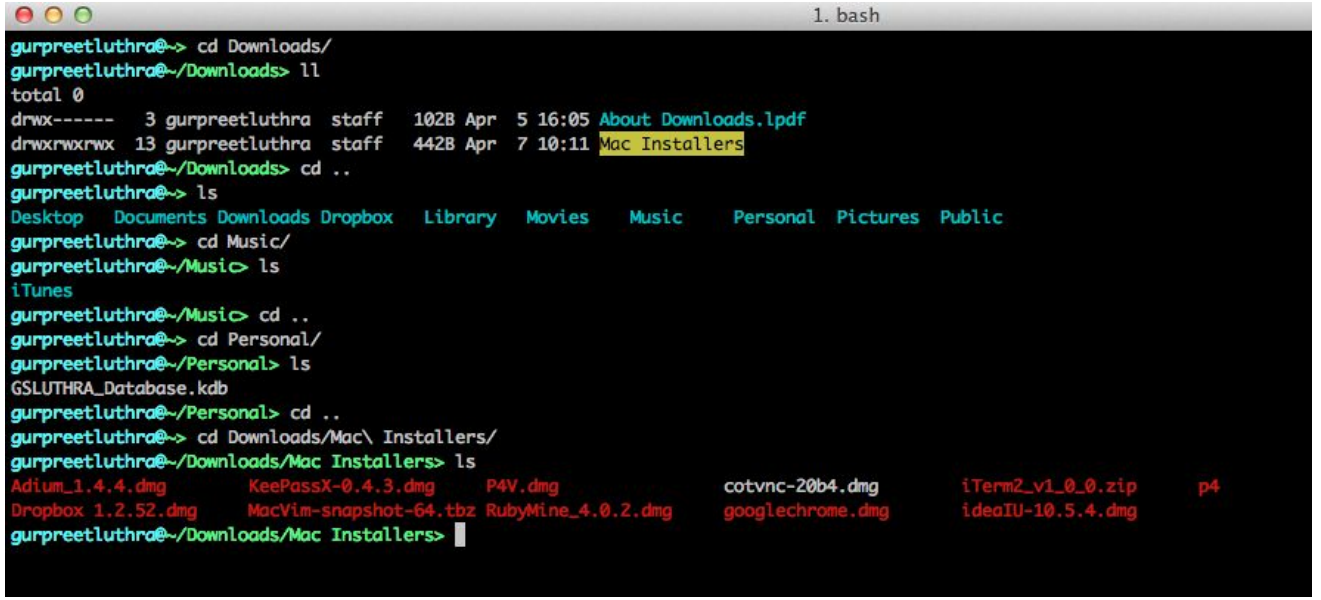
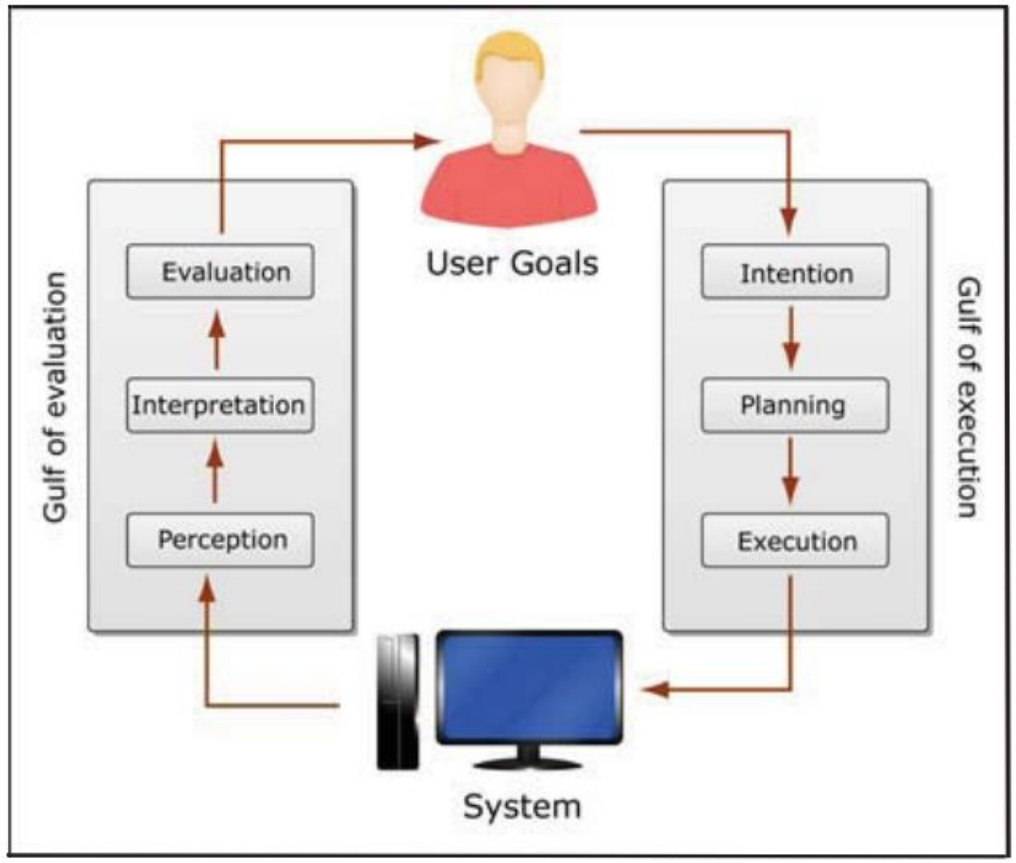


Fig 2: Command line based interfaces

A generalized Cognitive Model



- Learnability: Execution side
- Visibility & Feedback : Evaluation side
- Efficiency: Measure of whole cycle, speed of execution and perception
  - What I did Vs what just happened?

GoEv Vs GoEx

The Gulf of Evaluation (GoEv) is

- *the level of difficulty in assessing the state of a system*
- *how well the artifact supports the discovery and interpretation of that state*

The Gulf of Execution (GoEx) is

- *the difference between the intentions of the users and what the system allows them to do*
- *how well the system supports those actions*

https://www.interaction-design.org/literature/article/simplicity-in-design-4-ways-to-achieve-simplicity-in-your-designs

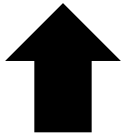
Norman's 7 stages of Actions

7 questions	GOAL	WORLD	EXECUTION	EVALUATION
What do I want to accomplish?				
What are my alternatives?				
What can I do now?				
How do I do it?				
What happened?				
What does it mean?				
Is it OK? Have I accomplished my goal?				

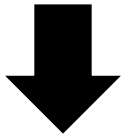
7 Stages of Action:

- Goal: edit an image
- Plan: How to do, search for brightness button/option
- Execute: Use the button/option to brighten the image
- System: Respond with some output
- Perceive: Did the brightness command/option do what it was supposed to do?
- Interpret: Has the image been brightened? If not, Any alternatives?
- Evaluate: The image looks like what I imagined/wanted

Smaller GoEx & GoEva



Learnable Interface



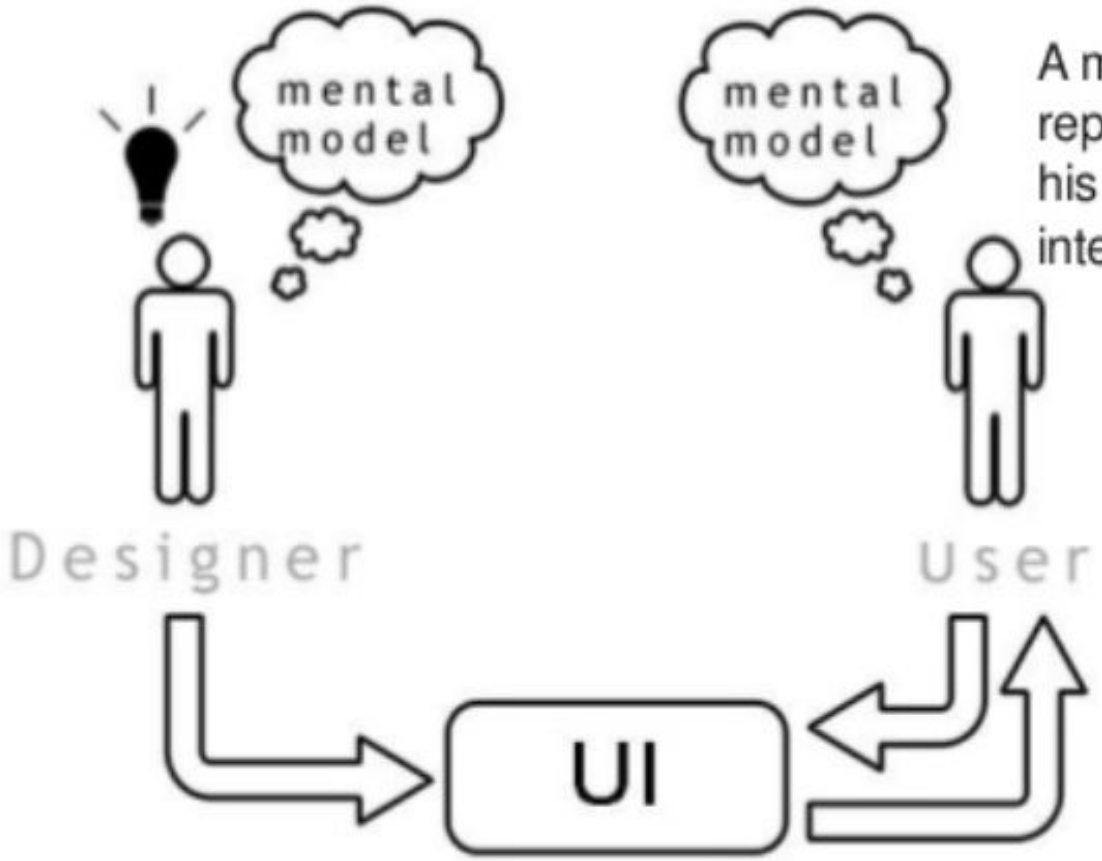
Easier to execute

Easier to Compare

Fig 1: Microwave model I

Fig 2: Microwave model 2

Mental Model vs Conceptual Model



A mental model is the representation that a person has in his mind about the object he is interacting with.

A conceptual model is the actual model that is given to the person through the design and interface of the actual product.

https://www.slideshare.net/limdonald/web-design-through-the-lens-of-psychology-23548623

Conceptual models

Fig 1. Scissors

Fig 2. Files in folders Icon

- describe how an interactive system is organized
- Is the foundation of the interface.
- Ask:
  - what users will be able to do
  - what concepts or knowledge users will need, in order to interact
  - how they will interact with system (at a very high level)

Mental models

- Users “see” the system through mental models
- Users “rely” on mental models during usage
- Reason about a sys
  - Interact with
  - Infer how it works
  - Figure out how to correct when things do wrong

Don Norman’s example

- https://www.youtube.com/watch?v=pAOyWFOFhsg

System Image

- The designer's conceptual model
  - How do I want it to be, work and operate?
- The system Model:
  - Actual physical structure, documentation
- User's mental model
  - How is it supposed to be or work?
- DESIGN FLAW
  - Designer's model = User's model

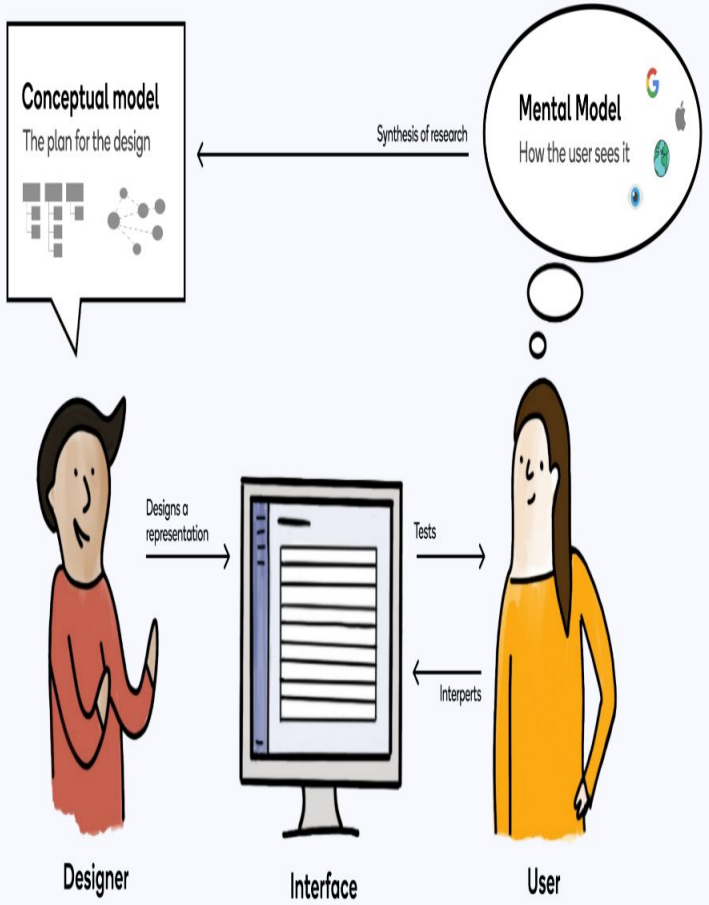


Fig 3. conceptual Vs Mental Model
https://uxdesign.cc/understanding-mental-and-conceptual-models-in-product-design-7d69de3cae26

How designers can bridge the Gulf?

- Bridge gulf of execution by:
- ○ Signifiers, constraints,
- mapping, conceptual model
- ● Bridge gulf of evaluation by:
- ○ Feedback, conceptual model
- ● Help users answer these →
- questions
- ○ 7 questions; 7 stages