Lecture – 4

Principles behind the HAX guidelines

Logistics

- Class timings: 10:35 – 11:50

Recap

- Applying HAX guidelines to an interface
- Homework:
  - Designing interface for course recommendations on Pingala
  - “Implement” all 18 guidelines (reason when something is not relevant)
- Why the guidelines work
  - Mental models

Mental models

- A mental model is a person's internal representation of how something works in the real world
- Framed from past experiences, refined over time
- Helps people understand, reason, predict behaviors of systems
- When user mental model clashes with system’s actual model
  - Misuse / incorrect use / underuse
  - Over trust / under trust
  - Stuck when things go wrong
- Some guidelines → set appropriate mental models

Gulf of execution and gulf of evaluation

- When performing any goal-oriented task / operating any system, one must…
  - Know what they want to achieve
  - Know how to achieve it with that system (what actions)
    - E.g., what button to press, what commands to provide
  - Once actions done, evaluate what the action did
    - E.g., Once button pressed, screen changes, loading icon shows up
  - Evaluate against what your goals are
    - For next actions/subgoals → Done, do more, do other actions, undo, …

Gulf of execution and gulf of evaluation

- When performing any goal-oriented task / operating any system, one must…
  - Know what they want to achieve
  - Know how to achieve it with that system (what actions)
    - E.g., what button to press, what commands to provide
  - Once actions done, evaluate what the outcome was & whether it is desirable
    - E.g., Once button pressed, screen changes, loading icon shows up
  - Evaluate against what your goals are
    - For next actions/subgoals → Done, do more, do other actions, undo, …

Gulf of execution

Gulf of evaluation

Formal definitions

- The gulf of execution → mismatch between user goals and actions they need to take to achieve those goals
  - Difficulty users encounter when trying to figure out how to operate a system to accomplish their desired tasks
- The gulf of evaluation → the difficulty users have in understanding the system's state and determining if their actions were successful.
  - It's the challenge of interpreting system feedback to know if the desired outcome was reached

How to reduce these gulfs

- Gulf of Execution → affordances and signifiers
  - Make clear what a system can do
  - Including type, close buttons, … (affordances = possible actions, signifiers=signage saying what affordance exists and for what)
  - X => indicates close, chat icon => indicates hailing / invocation
- Gulf of evaluation
  - Make clear system status (thinking, generating, …)
  - See outcomes (when action taken / not, say so!)
  - Allow undo / stop action

Examples in HAX guidelines

- Easy dismissal
  - “Shut up Alexa”
- Easy invocation
  - “Ok google”
- Easy corrections
  - I said “k-a-n-p-u-r”
- Common usability guidelines implement the gulf principles, important for good AI interfaces as well

Limitations of human memory

- Bad at remembering
  - Needs multiple repetitions to recall well
- Good at recognizing

- Recognition over recall → remember history

Principles of human reasoning

- Inferences, Predictions, Generalizations
- Infer new propositions based on given set of propositions
- All things about explanations
  - Why, why not, inferences, …
  - Examples and counterexamples

- More about this when we come to explanations!

Sociological theories / rules

- Predict what one needs, social norms, …
- Next class.

Reminder

- Homework due on Friday
- Do your readings
- A quiz coming up next Friday