CPSC 100

Computational Thinking

Internet

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Department of Computer Science
University of British Columbia

Agenda

- AR/VR Demo Video
- HCI Usability Components
- HCI Usability Heuristics

Learning Goals

After this **today's lecture**, you should be able to:

- **Understand** and describe the **first five usability heuristics** proposed by Jakob Nielsen.
- **Explain why** each heuristic is important in designing usable systems.
- **Illustrate** how each heuristic appears (or is violated) in real-world interfaces using provided examples.
- **Compare and contrast** different heuristics using concrete UI examples to determine which are adhered to or violated.

Course Admin

Course Admin

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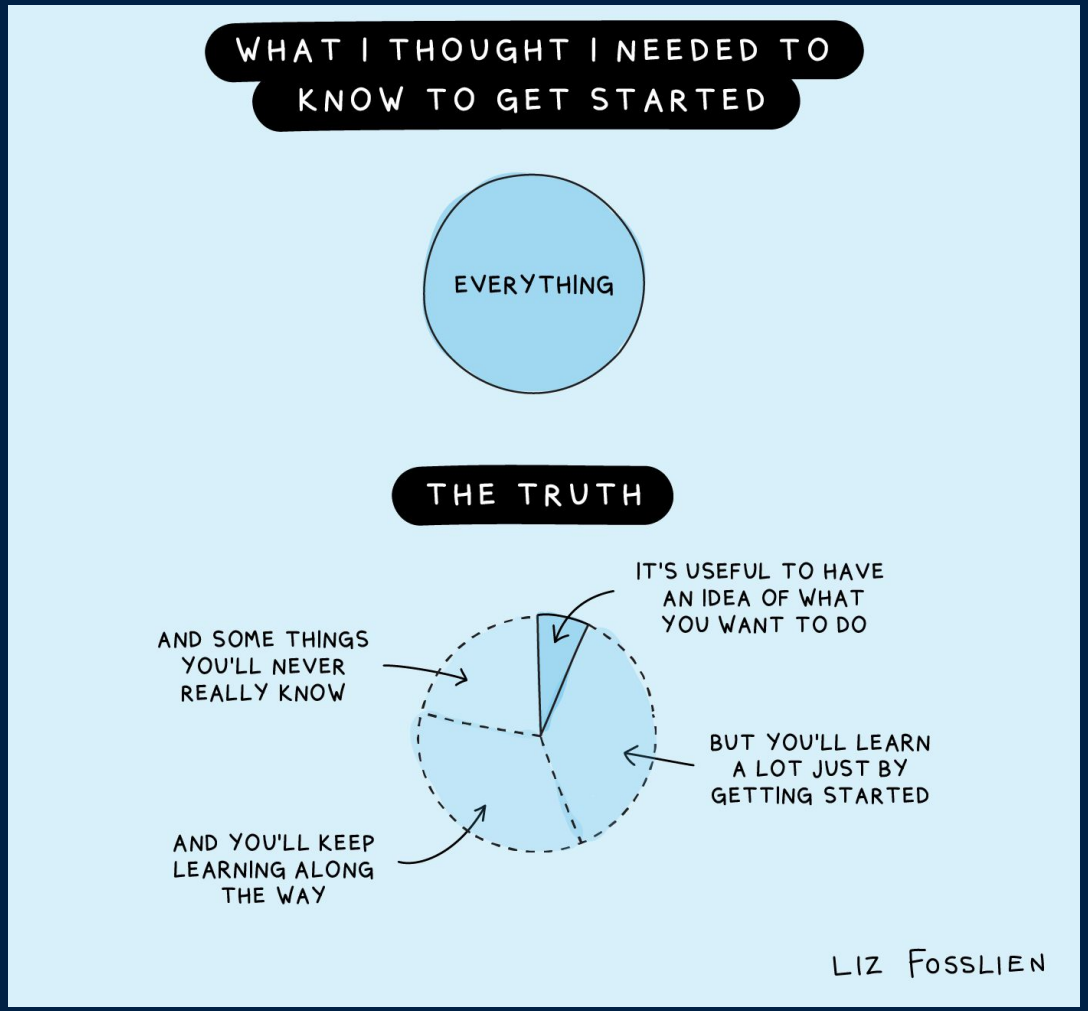
Wrap up

Wrap Up

-


WHAT I THOUGHT I NEEDED TO KNOW TO GET STARTED
EVERYTHING
THE TRUTH
IT'S USEFUL TO HAVE AN IDEA OF WHAT YOU WANT TO DO
AND SOME THINGS YOU'LL NEVER REALLY KNOW
BUT YOU'LL LEARN A LOT JUST BY GETTING STARTED
AND YOU'LL KEEP LEARNING ALONG THE WAY
LIZ FOSSLIEN

AR + VR

Augmented + Virtual Reality

Virtual Reality (VR)

- Use of computers to simulate a real or imagined environment
- Three-dimensional (3-D) space

Meta Quest 2019-now

Augmented Reality (AR)

- Uses an image of an actual place or things that adds digital information to it

Google Glass 2014-15

Augmented + Virtual Reality

Participation Question

How do you feel about Meta's AR glasses?

Net positive for society	Net negative for society
	It's complicated…

ORDER FOOD ONLINE
Can I Help?
ARTIFICIAL INTELLIGENCE

How do we *design* for the future?

HCI: User Centered Design

HCI: Usability

- Quality attribute
  - Assesses how easy user interfaces are to use
  - Improving ease-of-use during the design process
- Defined by 5 quality components

HCI: Usability Components

1. Learnability
2. Efficiency
3. Memorability
4. Errors
5. Satisfaction

HCI: Usability Components

- **Learnability:**
  - How easy is it to learn task the first time?

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  - How pleasant is it to use the design?

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Activity

Intro to HCI Activity

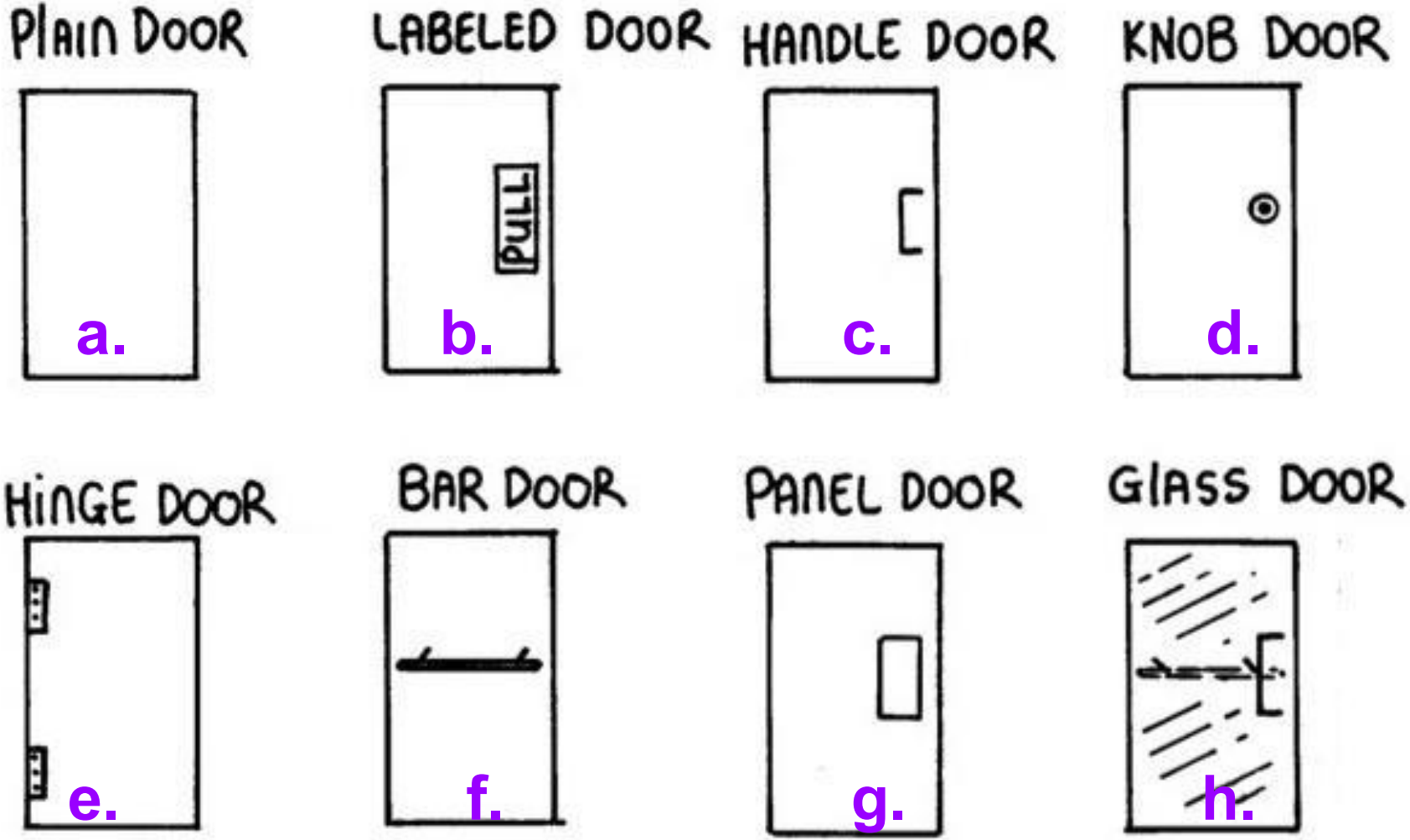
- **Answer on PrairieLearn Class Activity for today**

  1. Think of a technological interaction from last week that irritated you.

  2. Draw/visualize it (to the best of your ability)

  3. Explain exactly HOW it failed for you. Depict activity, tasks, interactions.

  4. Doors!


PLAIN DOOR
a.
LABELED DOOR
PULL
b.
HANDLE DOOR
c.
KNOB DOOR
d.
HINGE DOOR
e.
BAR DOOR
f.
PANEL DOOR
g.
GLASS DOOR
h.

Q: How does this door work?

iClicker

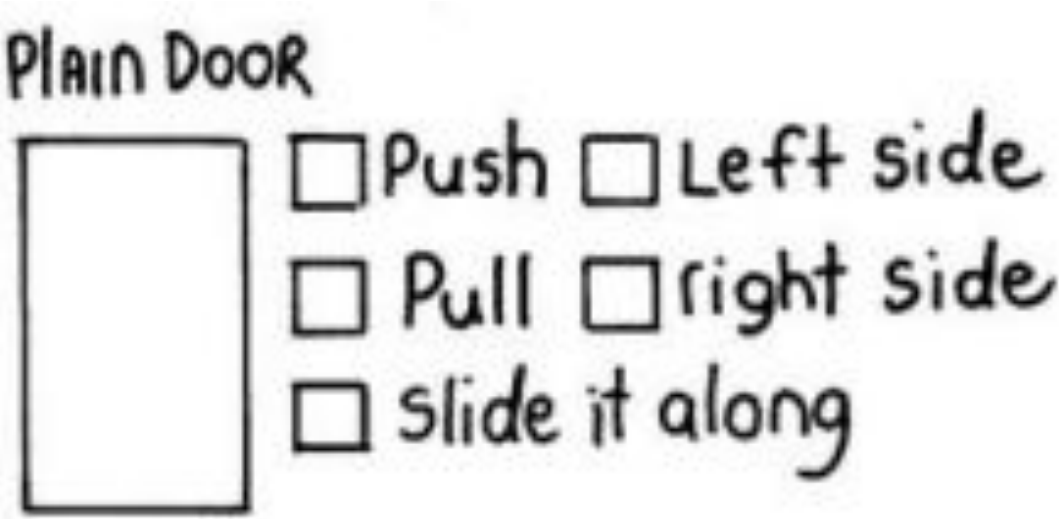
A. Push to the left

B. Push to the right

C. Pull on the left

D. Pull on the right

E. Slide it along



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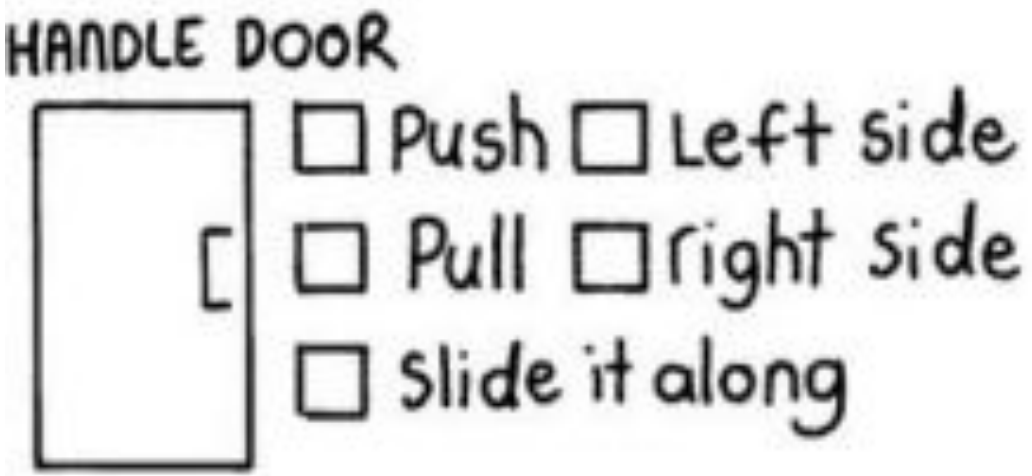

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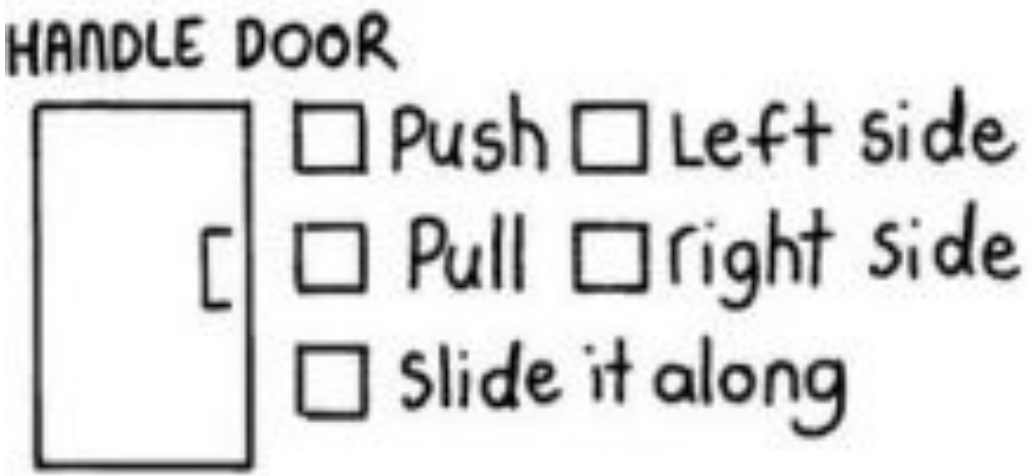

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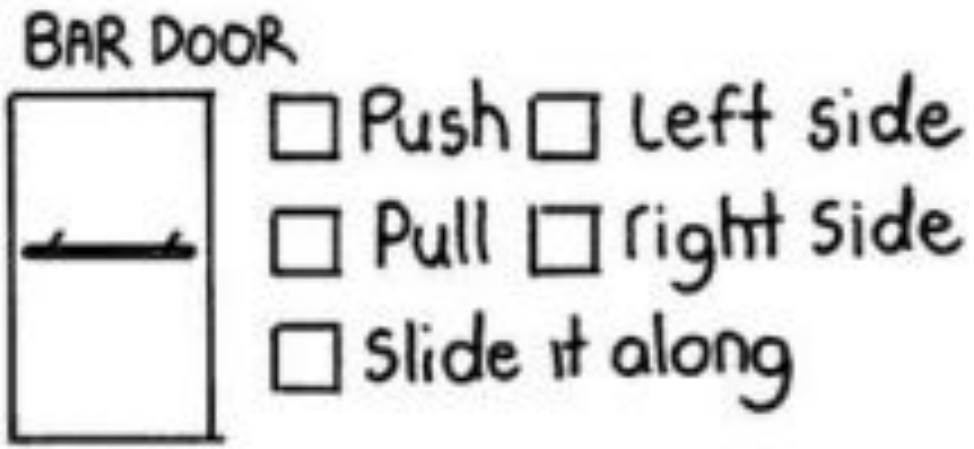

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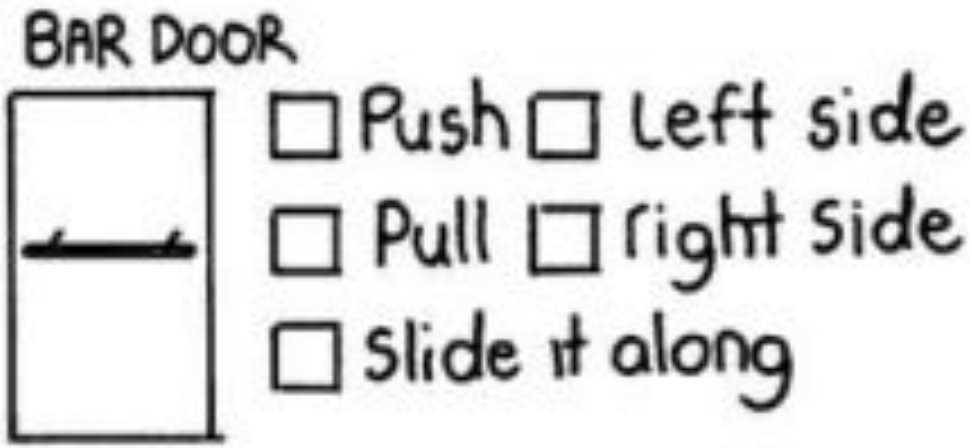

Learning Goals

What are Usability Heuristics?

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What is Usability?

Recall

HCI: Usability

- Quality attribute
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HCI: Usability Components

Recall

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What are Heuristics?

What is a Heuristic?

Practical method or guideline

- Used to facilitate
  - Problem-solving
  - Learning
  - Discovery

- Often referred to as a "**rule of thumb**"

Reference: Nielson Norman Group: Usability 101 - Introduction to Usability [Link]

Usability Heuristics

10 Usability Heuristics (Nielsen, 1993)

Visibility of System Status

1

Match Between System & Real World

2

User Control And Freedom

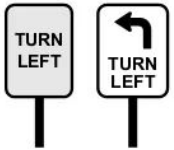
3

Consistency And Standards

4

Error Prevention

5



Recognition Rather Than Recall

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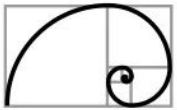
Flexibility And Efficiency of Use

7



Aesthetic And Minimalistic Design

8

Help Users With Errors

9

Help And Documentation

10

Reference: Nielson Norman Group: Usability 101- 10 Usability Heuristics [Link]; (image) uxdesign.cc -[Link]

1. Visibility of system status

- Keep users informed about what is going on
  - e.g., what page they are on and what part of a process
    - (# of steps left)
  - e.g., you are working in offline mode (connection lost) provide appropriate feedback

- About what system is doing, and how input is being interpreted

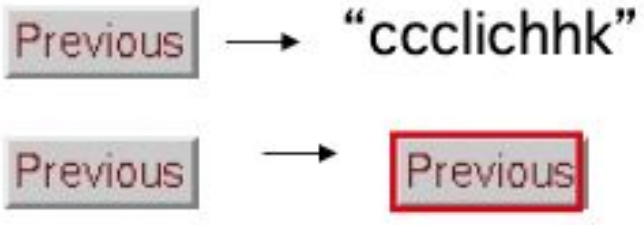
Reference: Nielson Norman Group: Usability 101- 10 Usability Heuristics [Link];

Example: Washroom door lock status

Visibility of System Status 1

Feedback

- Does the user know what happened?
- Sending information back to the user about what has been done
- Includes sound, highlighting, animation and combinations of these
  - e.g. when screen button clicked on provides sound or red highlight feedback:



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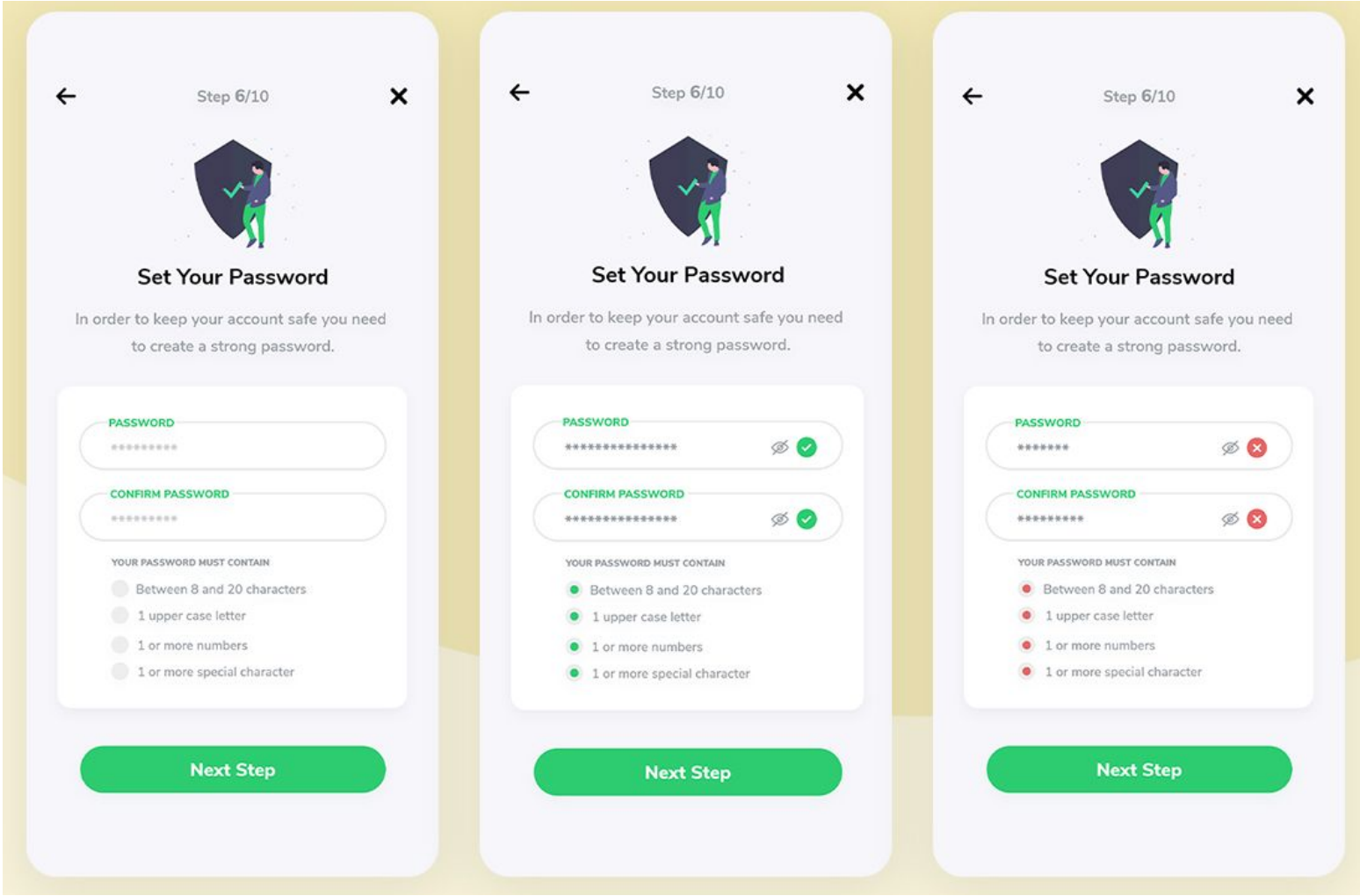


Visibility of System Status

1

Reference: Figma [Link]

2. Match System + Real world

- Terminology in user's language language from user's perspective
  - "you have bought..." VS "we have sold you..."
  - Use common words, not "techno-jargon"
- Error messages and feedback refer to user objects
- Avoid saying "you've entered an illegal input"

Reference: Nielson Norman Group: Usability 101- 10 Usability Heuristics [Link];

Match Between System & Real World

2

3. User control + Freedom

- Easy to abort: cancel buttons
  - e.g., being able to cancel/undo order
- Easy to undo
  - e.g., being able to go back to previous step (s)
- Easy to make changes
  - e.g., removing items from a shopping cart
- Users (even *experts*) will make errors!

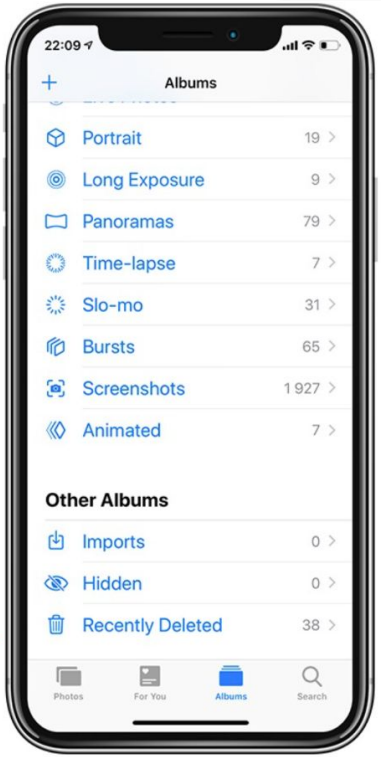
Reference: Nielson Norman Group: Usability 101- 10 Usability Heuristics [Link];

Example: User control + Freedom

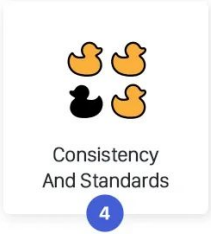
Undo the unwanted action.

Exit the navigation anytime.

Recover your accidentally deleted files.



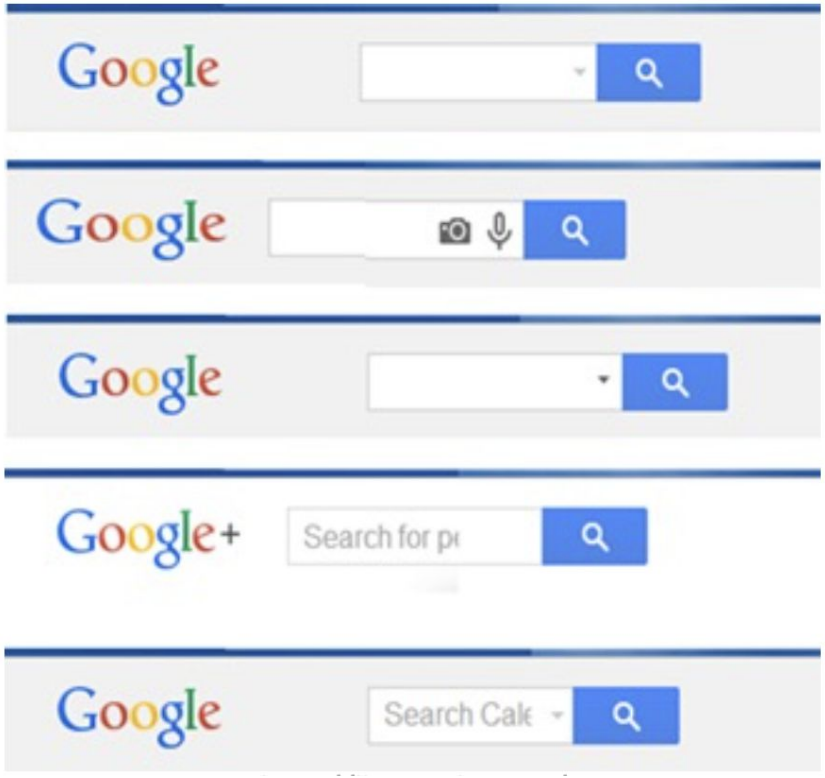
4. Consistency + Standards



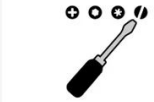
- Same commands always have the same effect
  - (e.g., ctrl+c)
- Locations for information, names of commands give the user a mental model of the system
- Size, location, colour, wording, function, sequencing
- Following standards helps
  - Web: use templates or css, style guides seems easy, but often not followed

Reference: Nielson Norman Group: Usability 101- 10 Usability Heuristics [Link];

Example: Google's Search bar



5. Error Prevention



- Constraints
  - Remove or gray-out illegal choices
- Auto-fill information from before
- Confirmation
  - Before making irreversible changes
  - Provide a way to "undo"
- Do not use colours to illustrate danger
  - Colour blindness / accessibility

Reference: Nielson Norman Group: Usability 101- 10 Usability Heuristics [Link];

Example: Alerts/Confirmation

Error Prevention 5

It seems like you have forgotten to attach a file.

You wrote "are attached" in your message, but there are no files attached. Send anyway?

Cancel OK

10 Usability Heuristics (Nielsen, 1993)

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iClicker

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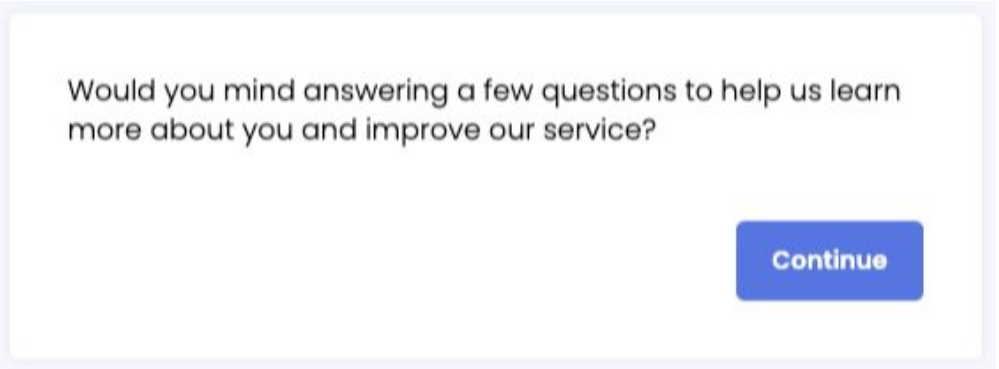

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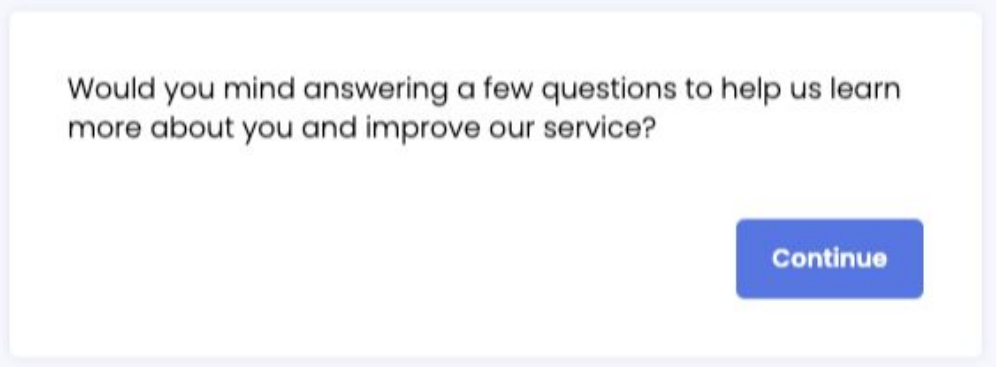

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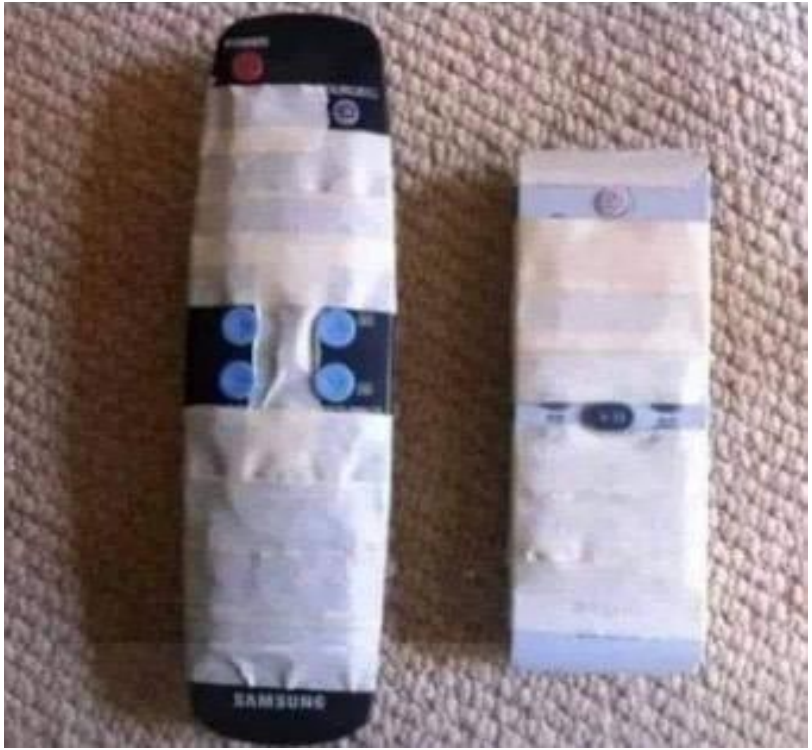

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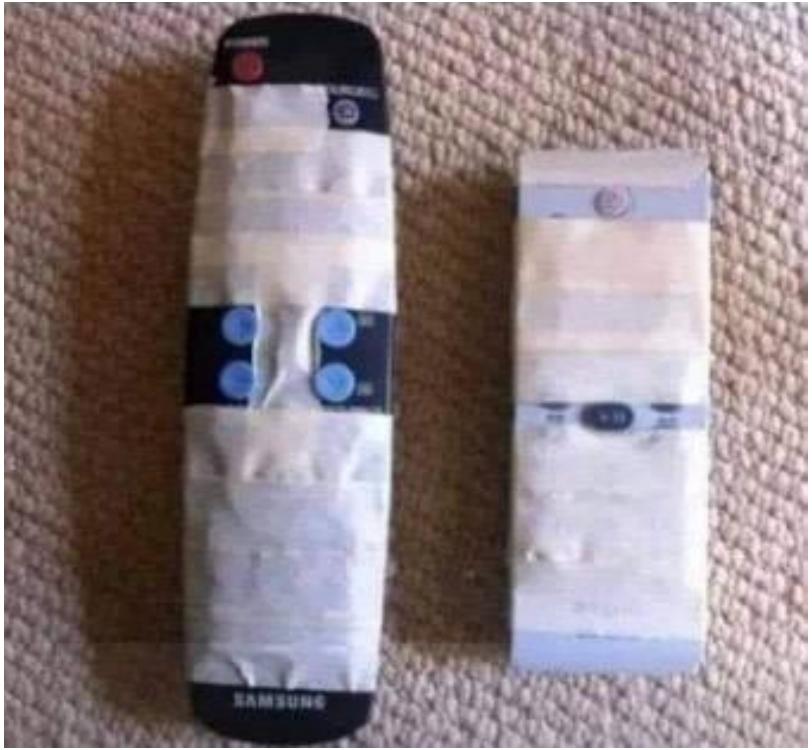

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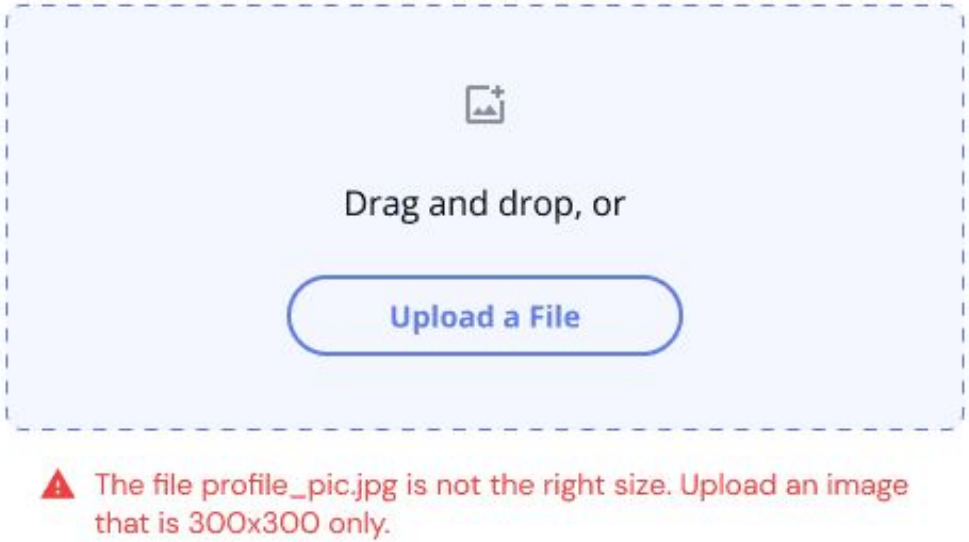

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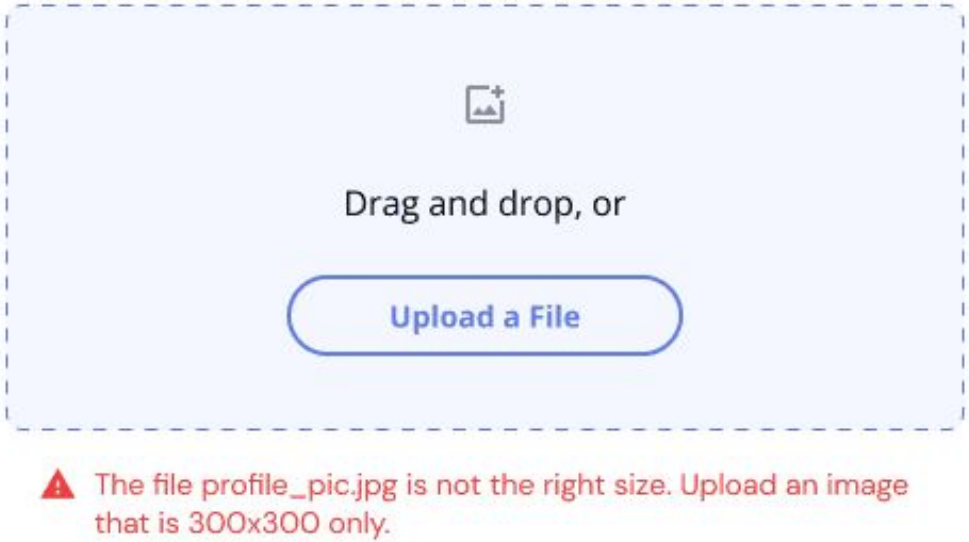

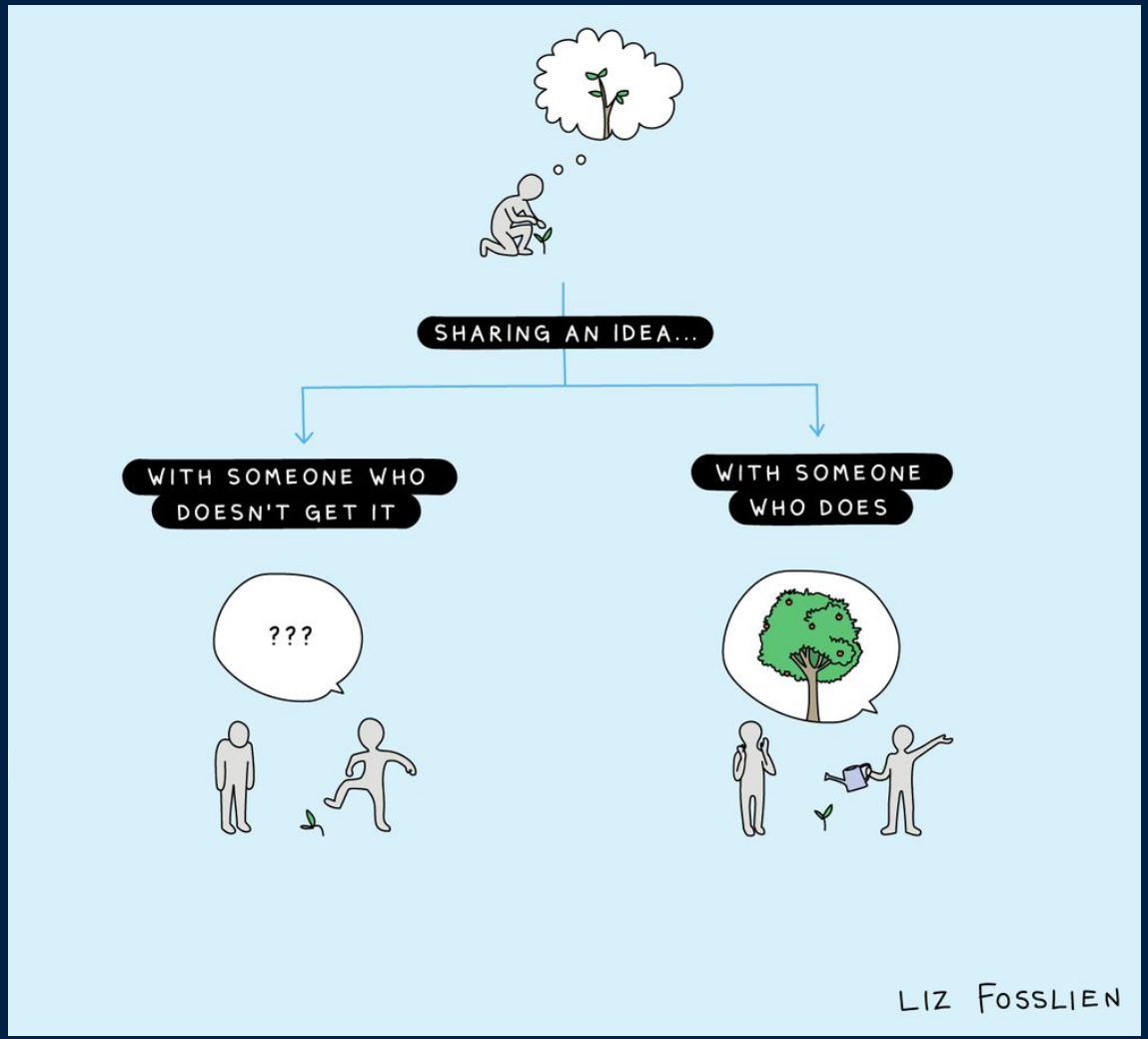
SHARING AN IDEA...
WITH SOMEONE WHO DOESN'T GET IT
WITH SOMEONE WHO DOES
???
LIZ FOSSLIEN

Wrap up

Extra Practice Questions

What is wrong?

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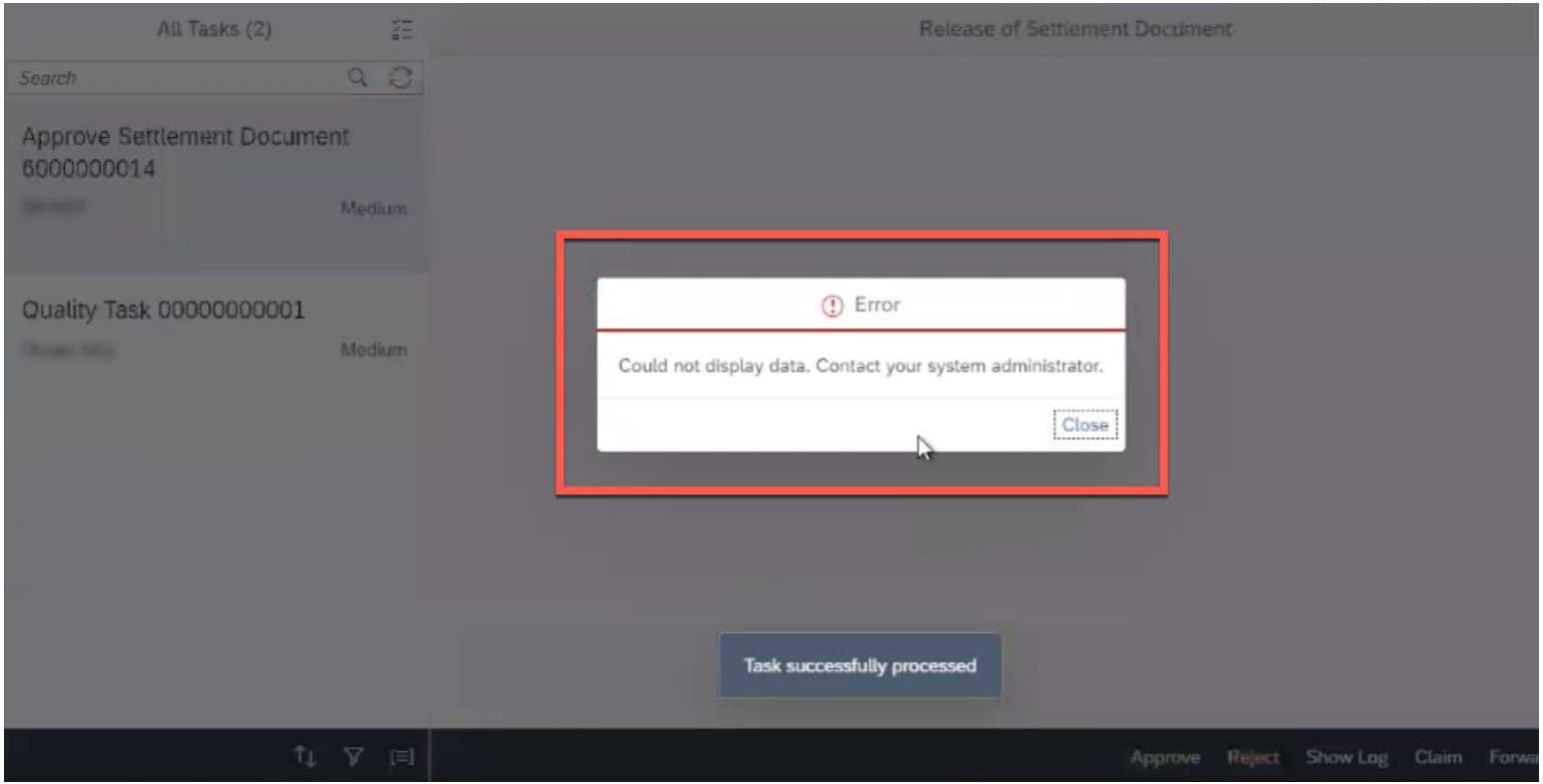

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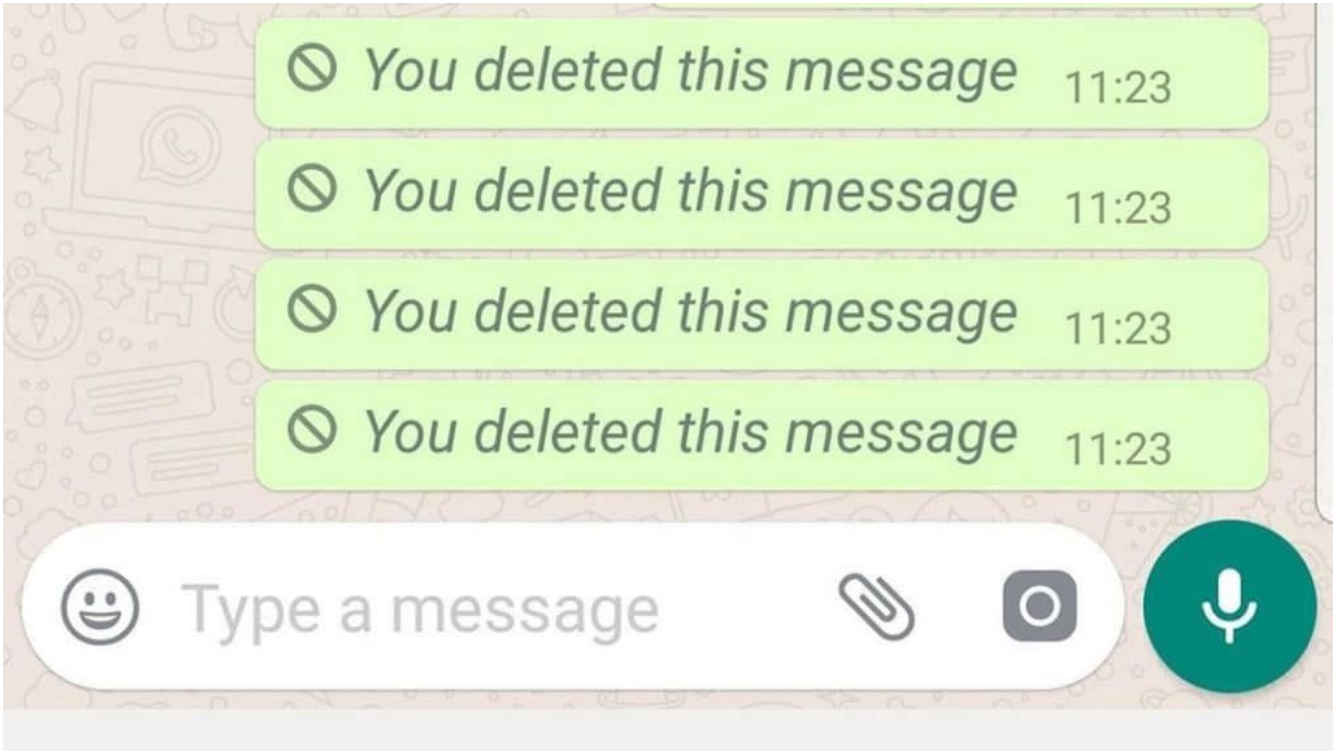

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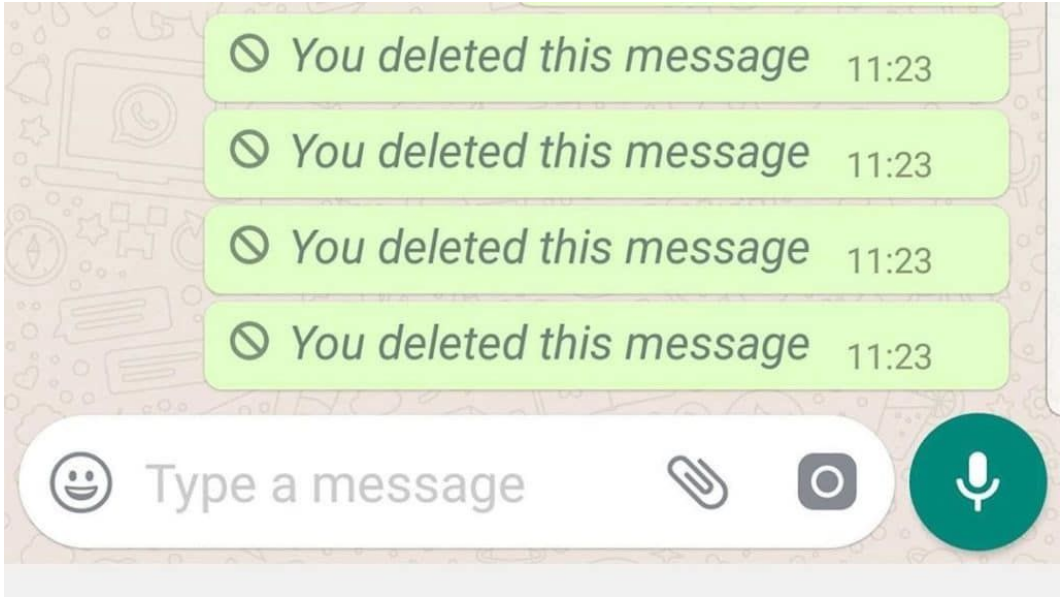

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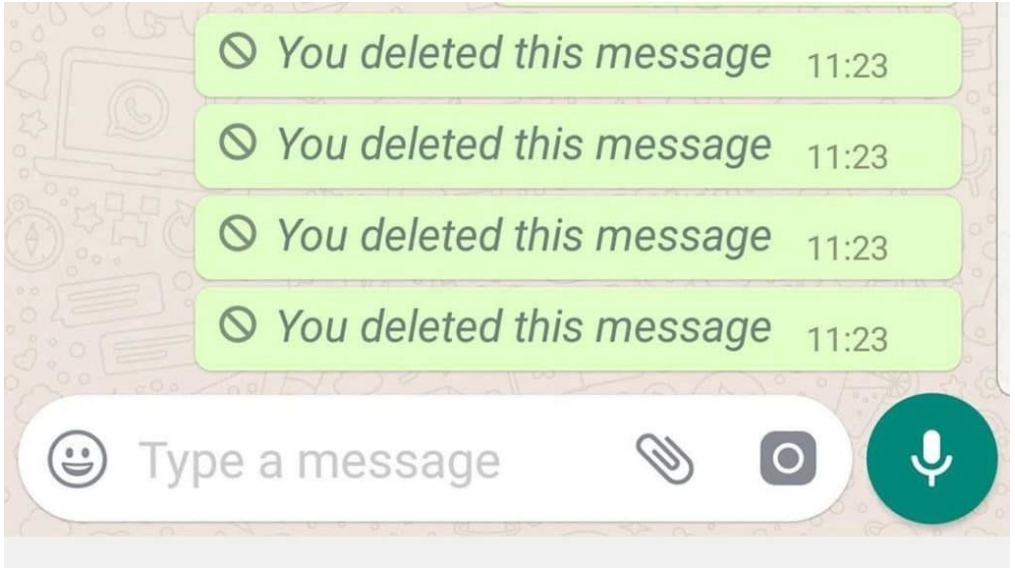

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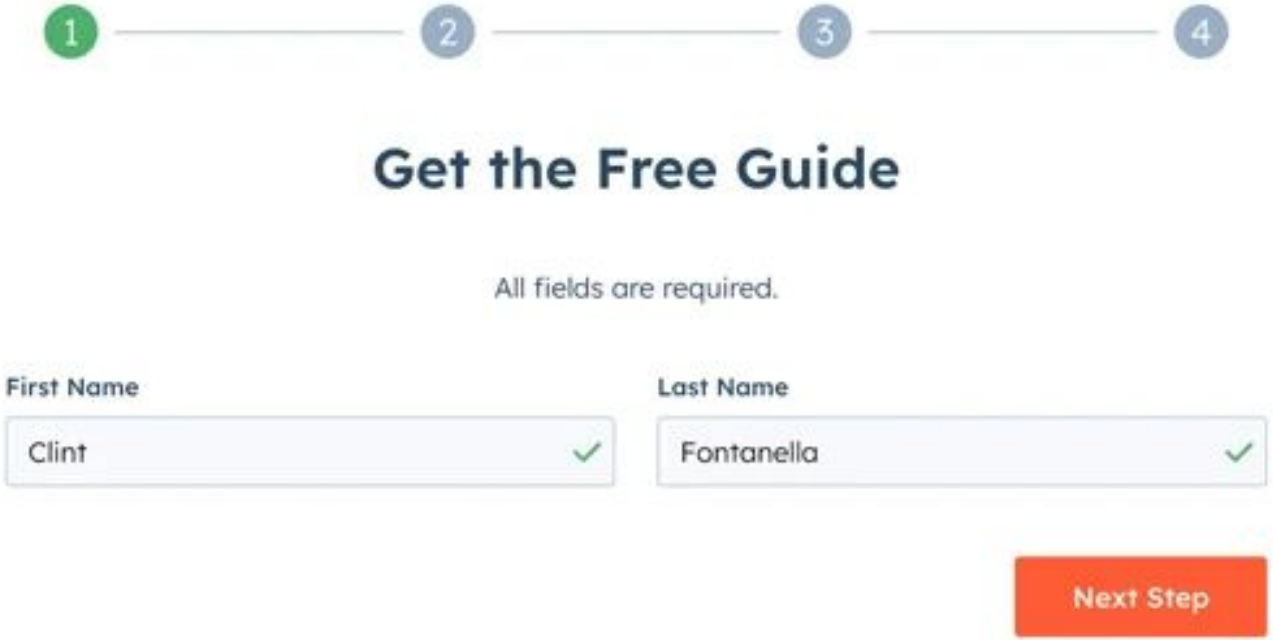

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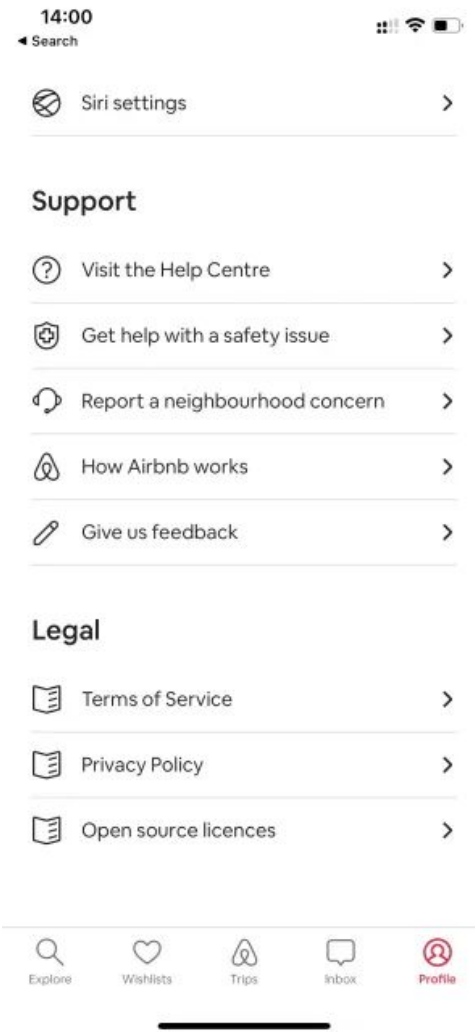

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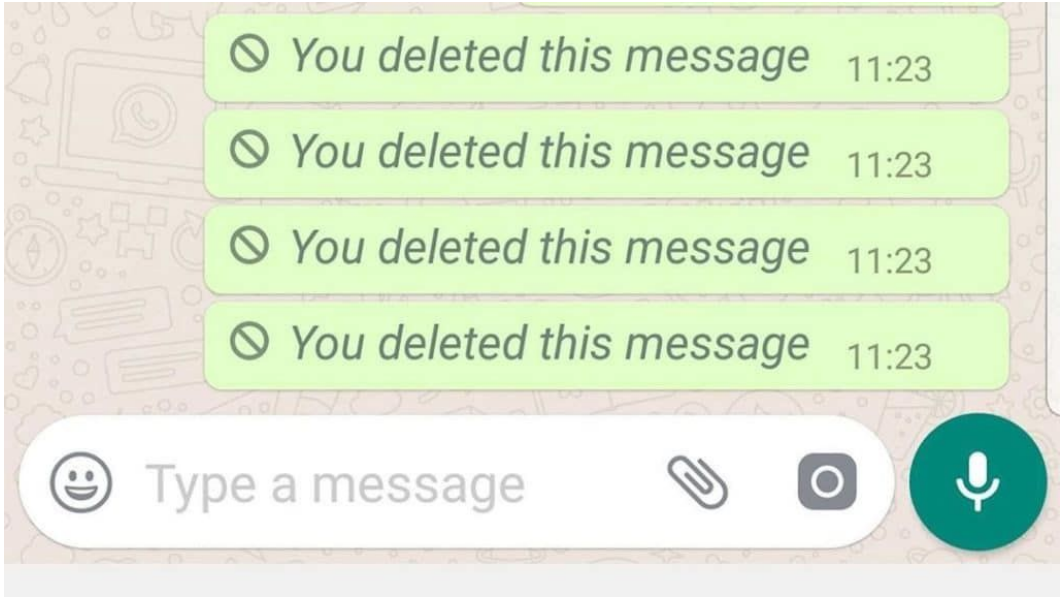

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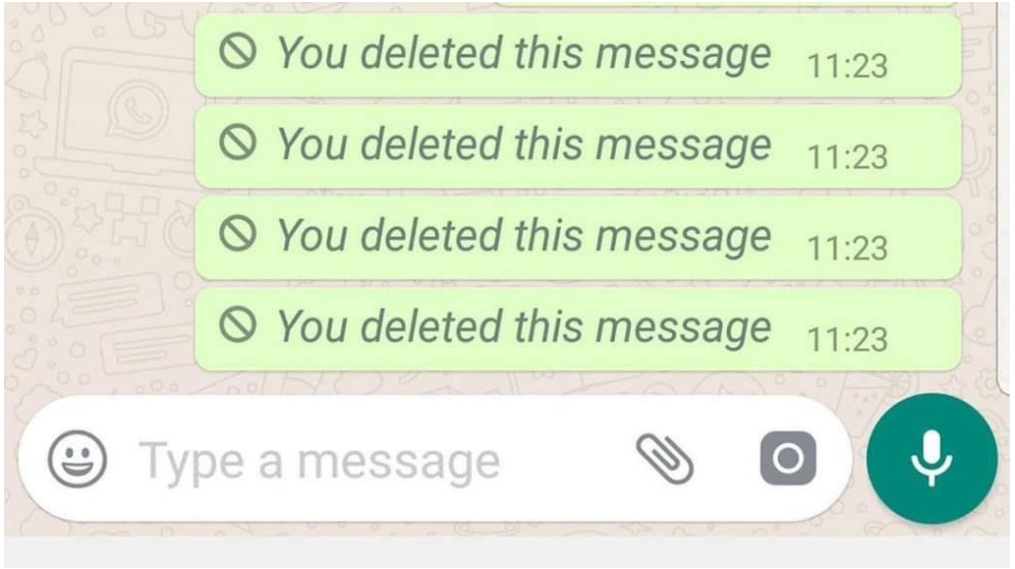

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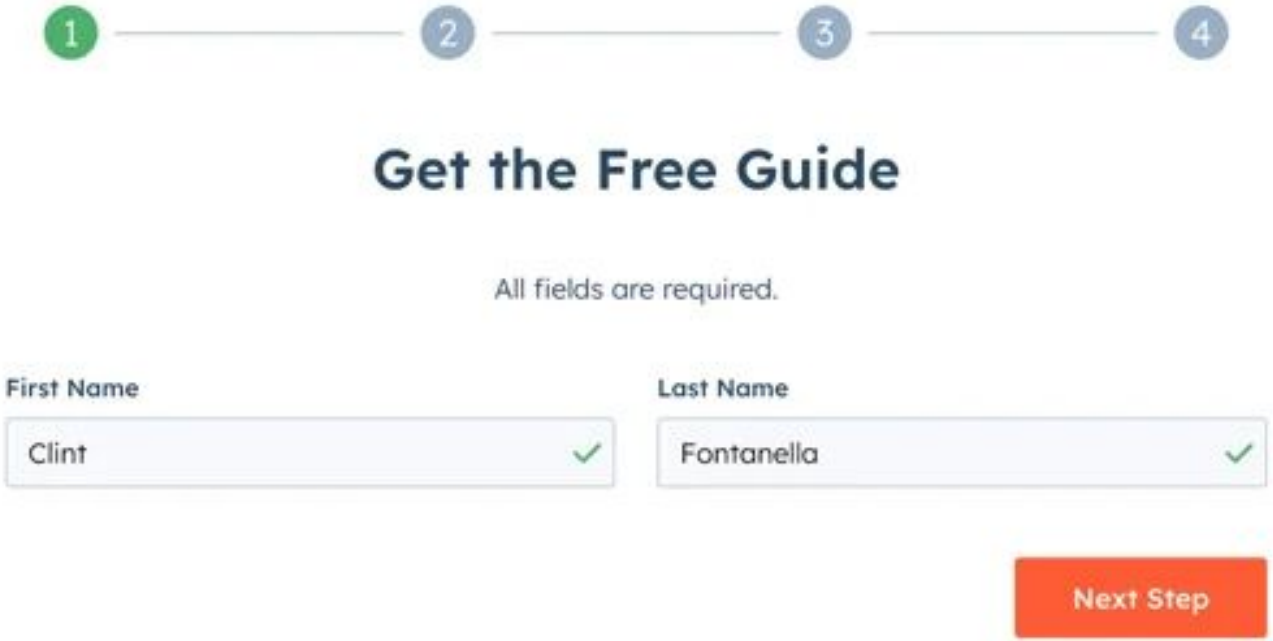

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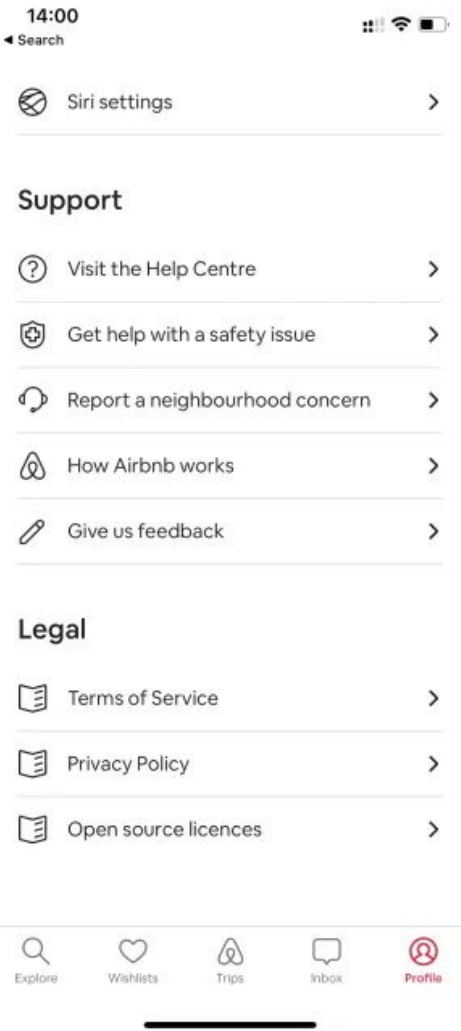

Identify the usability heuristic(s) that are satisfied in the following interface:

Q: Which heuristic does this interface adhere to?

iClicker

A. Recognition Rather Than Recall

B. Match between System & Real World

C. User Control and Freedom

D. Flexibility and Efficiency of Use

E. Error Prevention

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