Human-Computer Interaction: Heuristics

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Heuristics

- Basic idea: Broad set of principles that apply to practically any type of interface. They function as both a goal for good design and a key tool in some usability evaluations.

- Pros
  - Simple, high level, and easy to explain to others.
  - Many examples online of what "good" interfaces that follow principles look like.
  - Thinking about heuristics can help you spot problems.

- Cons
  - High level so may not provide useful guidance for low level problems.
  - Most common types of problems, but they do not represent all problems

Nielsen's 10 Heuristics

"Heuristics" are simple rules that can be easily applied and are true in most situations. Using the ten heuristics to the right we can detect a large percentage of usability issues.

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetics and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

Visibility of system status

- The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
- Why
  - People learn from seeing the feedback of their actions
  - Knowledge of system state is necessary for some actions

Visibility of system status

Me adding a Q&A session to my Google calendar

Visibility of system status

Better add a reminder
or I might forget to go

Is the reminder saved?

Visibility of system status

I clicked the back button without clicking "save" and get a warning.

Good example: clear which levels have been played, how they did, what level the player is currently on, and what levels are still locked.
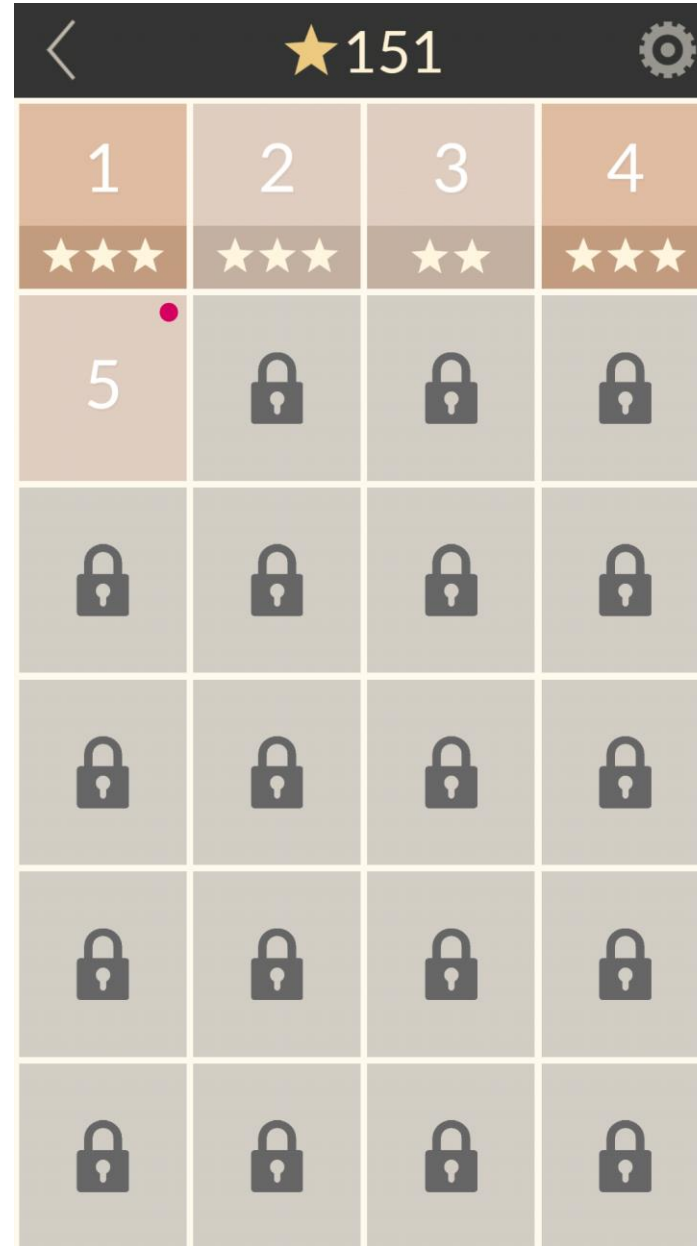
Match between system and the real world

- The interface should use concepts, language and real-world conventions that are familiar to the user.
- Why
  - The user already has knowledge from the outside world. A user interface can leverage that knowledge.
  - If the interface does not match the way the world typically works people will become confused.
  - Metaphors and affordances are useful here.

Knobs match burner positions

Knobs not aligned with "real world"

Notebook "tabs" -> browser "tabs"
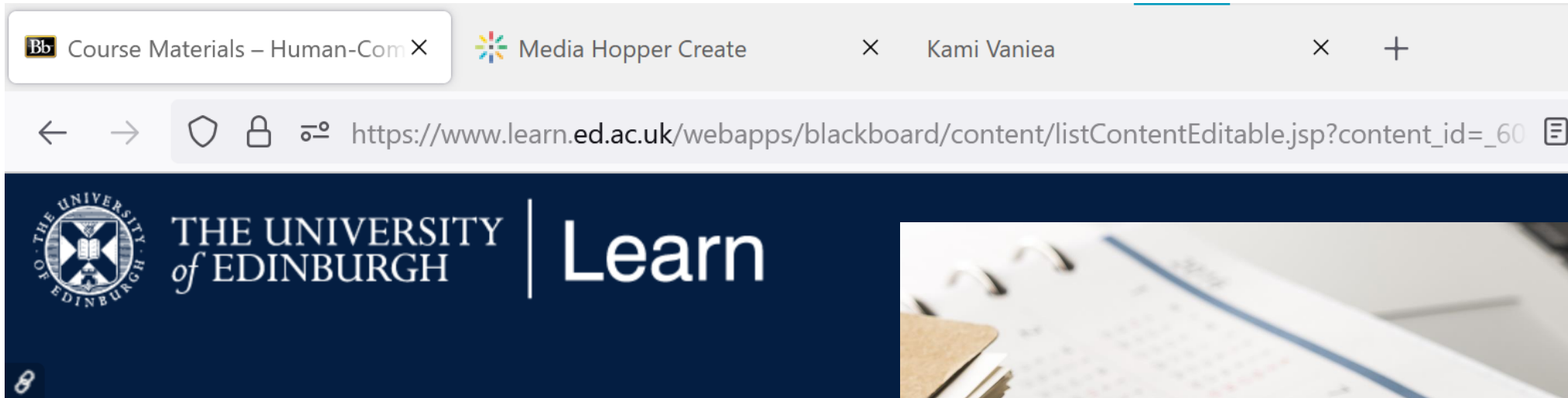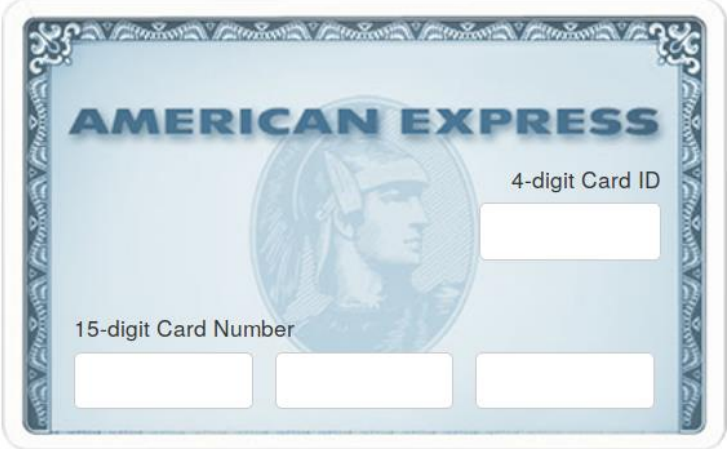
Good example: Data entry boxes match layout of the card.

User control and freedom

- Allow the user to have control of the interaction. Users should be able to undo actions, exit from any sequence of actions, and not be forced into a series of actions.
- Why
  - Users make errors sometimes.
  - They need the ability to go back and correct the errors.
  - Users need a way to "exit".

Poor example: cookie dialogs that only say: "I accept".

User has no choices and is forced into action.

Good example: clear undo button and an x for exiting the program. Also an eraser option.
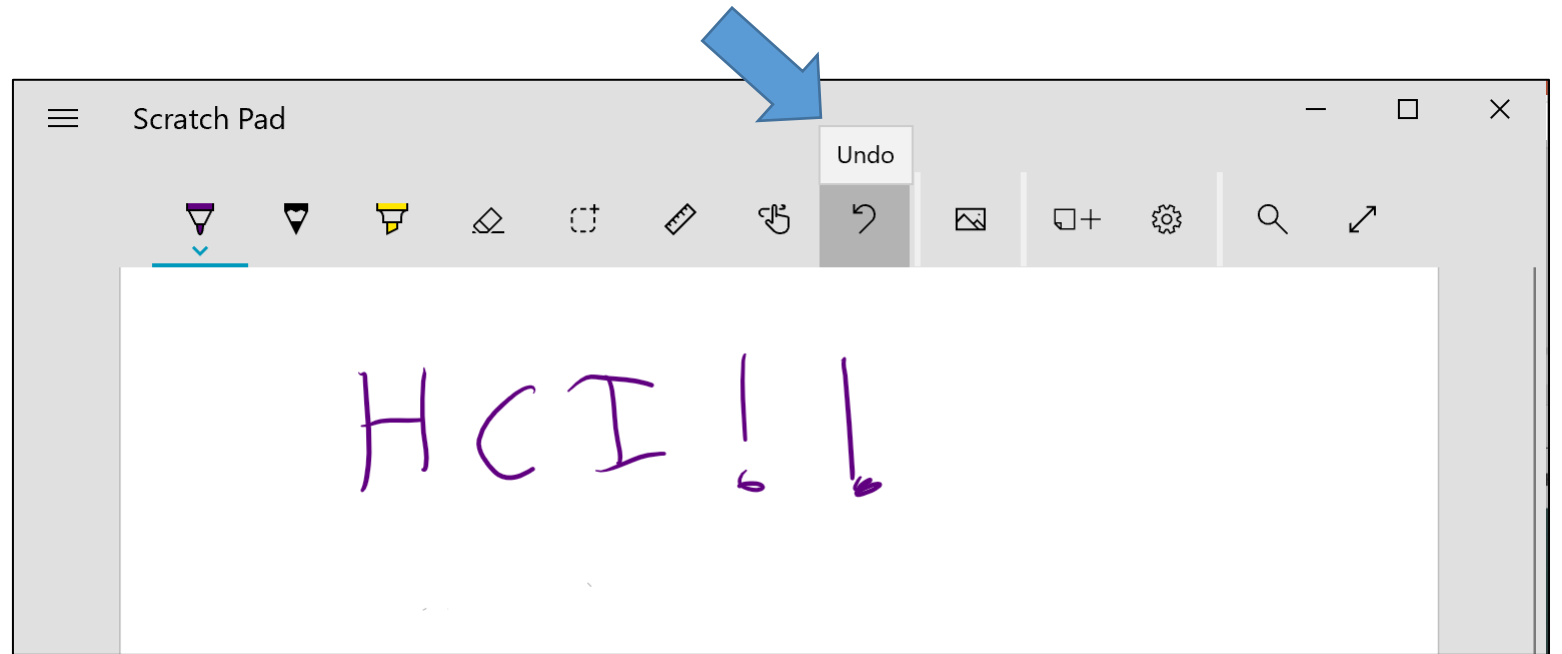
Good example: option to cancel the whole booking, not just continue.
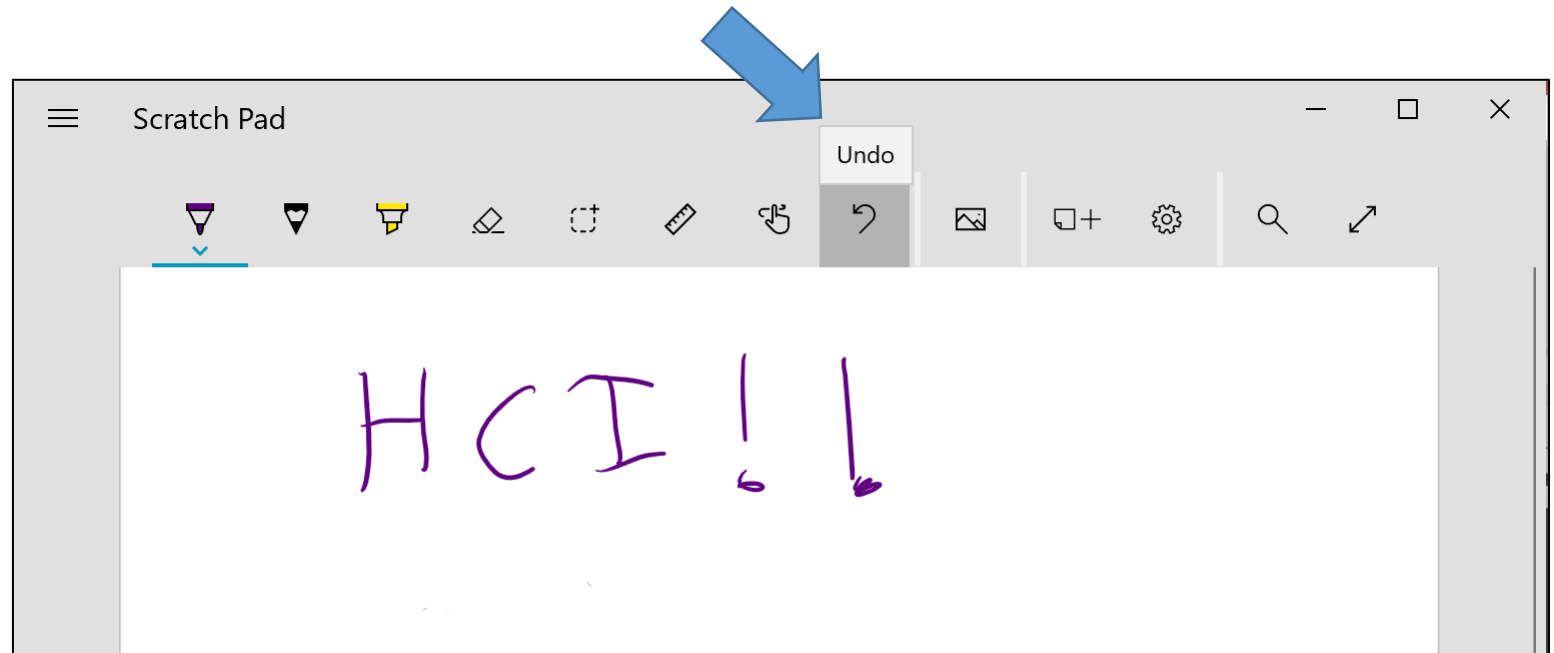
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Continue   [cancel entire booking]

Consistency and standards

- Information that is the same should appear to be the same.
- Information that is different should be expressed differently.
- Developers need to know the conventions being used in the software.
- Why
  - Similar to the real world heuristic, people can leverage things they already know.
  - They will expect that something they learned will continue to be true.

Poor example: Stop signs are always red….

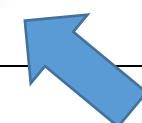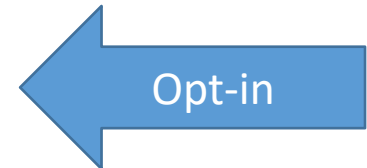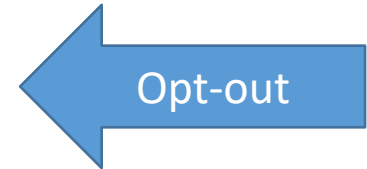# Poor example: tick boxes mean opposite things

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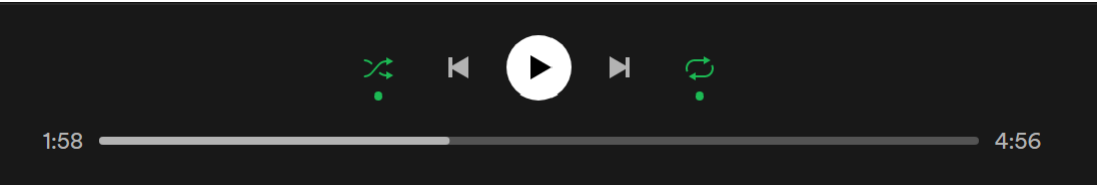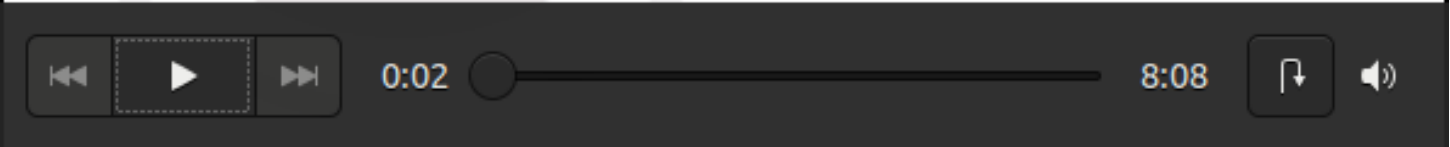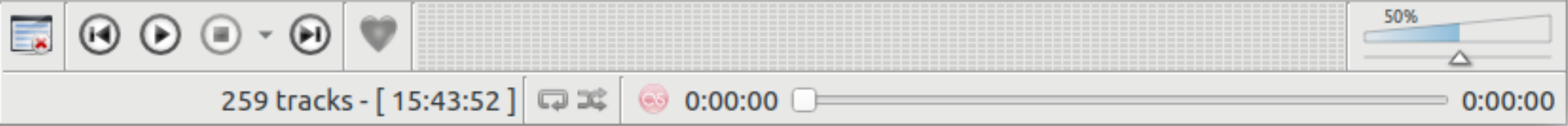
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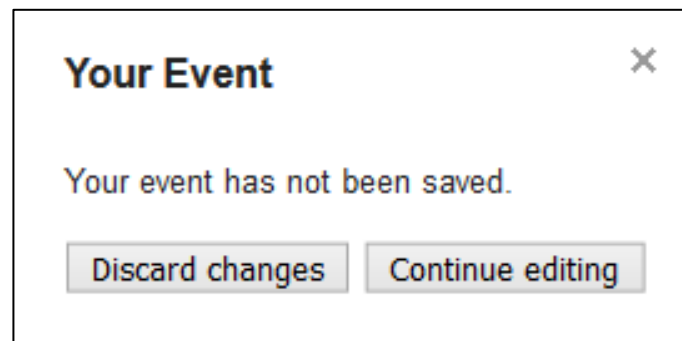
Opt-in

Continue   [cancel entire booking]

20

Good example: Media players all use similar button icons

Error prevention

- If possible, prevent errors from happening in the first place.

- Similar to visibility of system status, but specifically involves preventing an error from happening.

- Example: if the user needs to select 3 things, don't wait till the next screen to tell them that they have selected 4.

- Why
  - Users are not machines, they do not always perceive all the information available and they can temporarily forget things.
  - Computers are really good at using all the information available and remembering the last few things.

Your Event ✕

Your event has not been saved.

[Discard changes] [Continue editing]

Good example: ATMs give money after the card has been removed to prevent card-loss errors.

Good example: Drop down prevents users from entering impossible dates. CVV field also checks for numbers when typing.
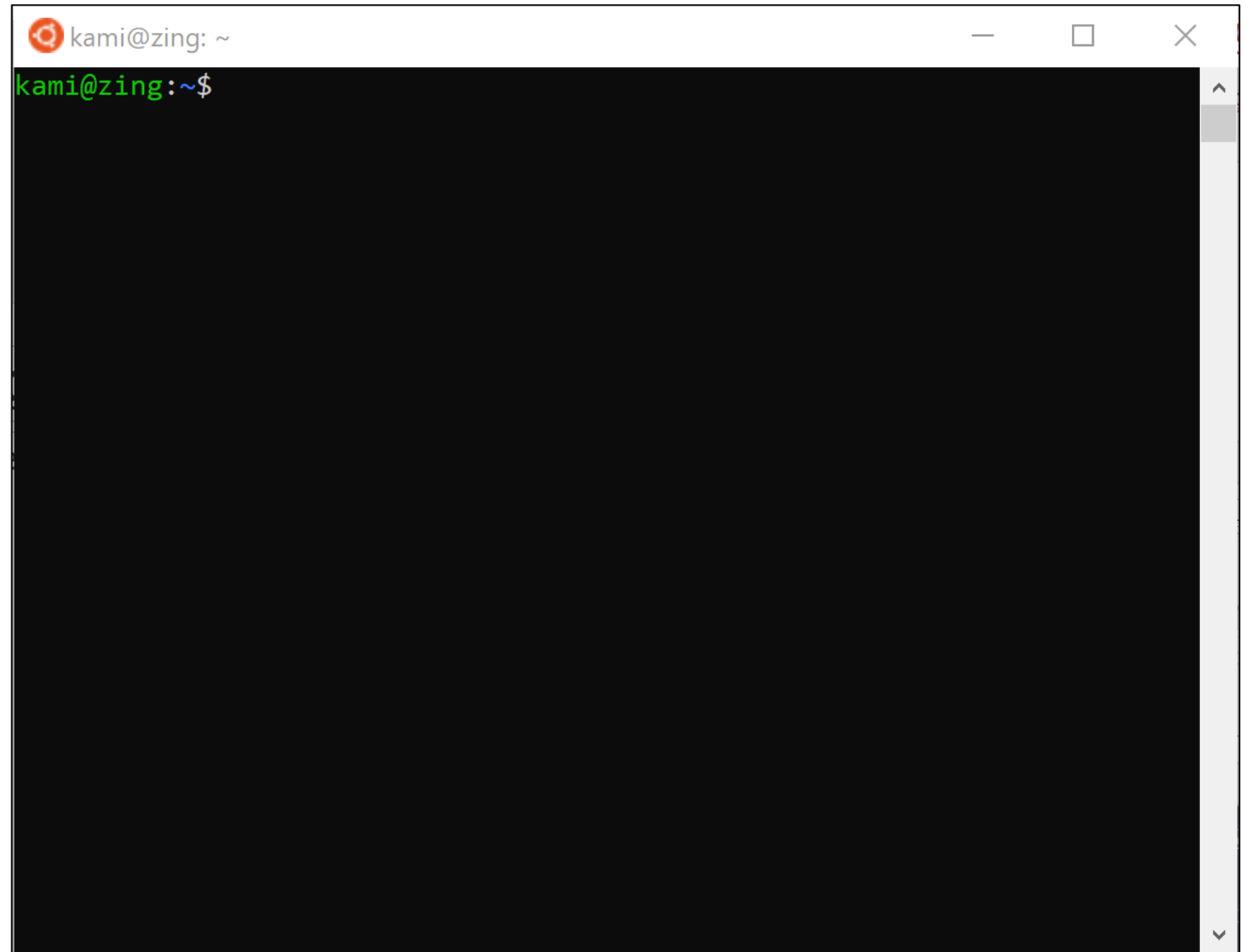
Recognition rather than recall

- Show all the options available to the user rather than expecting them to remember them all.

- Do not require users to remember information from one screen to the next.

- Why
  - People are less good at remembering (recall) than they are at recognizing (recognition).
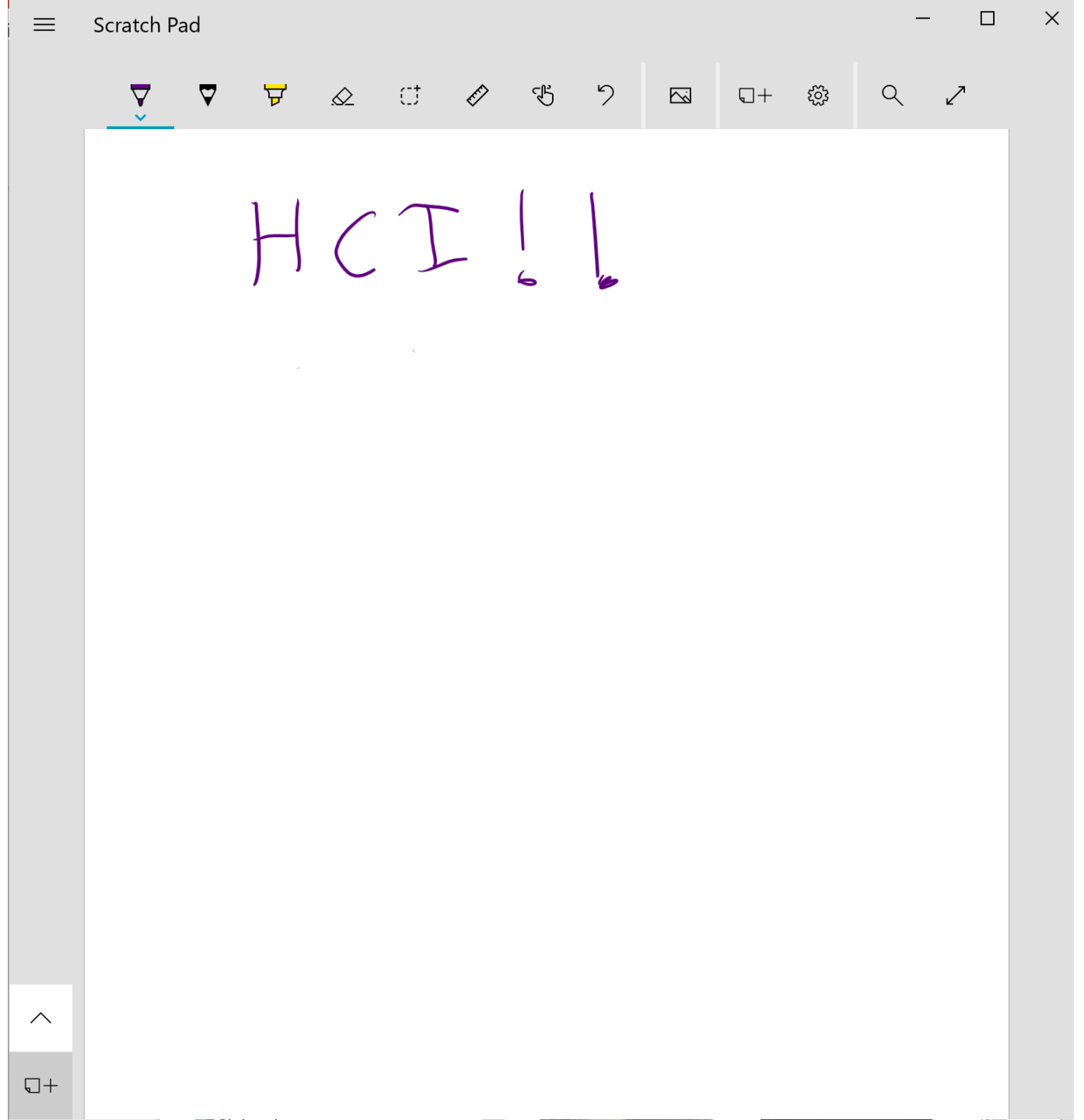
High recall example. User must memorize each command.

(Excellent flexibility though.)

Good example: all the main options are visible on the screen, user can recognize what they need rather than needing to recall where it is.

Scratch Pad

HCI ! l

Complex example: how do I add a gift card?

Flexibility and efficiency of use

- Experts should have a way to use the interface faster or more efficiently

- Design should have accelerators like keyboard shortcuts to allow skilled users to move faster

- Why
  - Using the mouse is MUCH slower than the keyboard. Users who know what they want should be able to find it quickly and efficiently
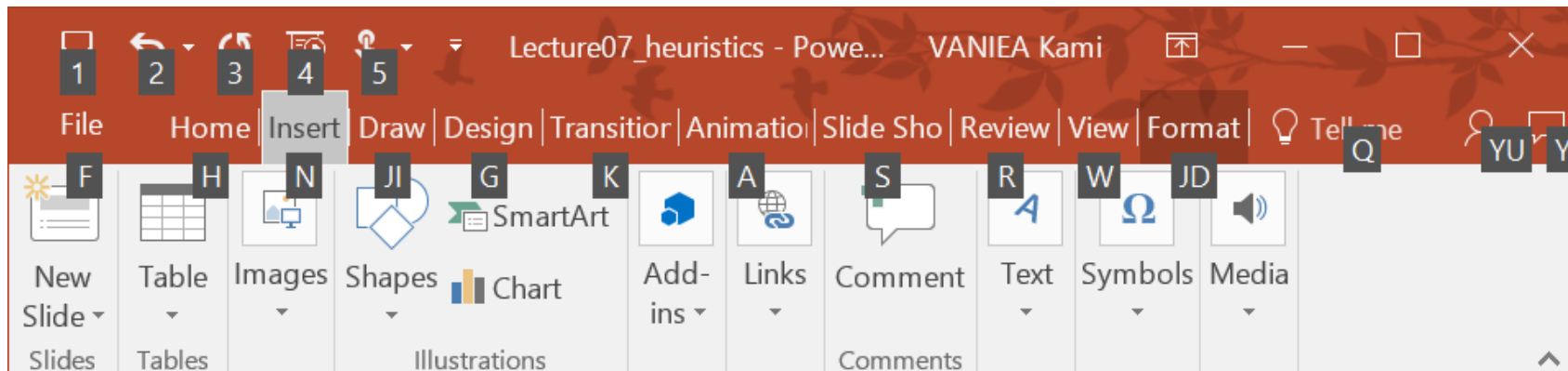
Good example: app positioning on home screens is up to the user on Android. New screen "pages" can also be created.

Ordered by function
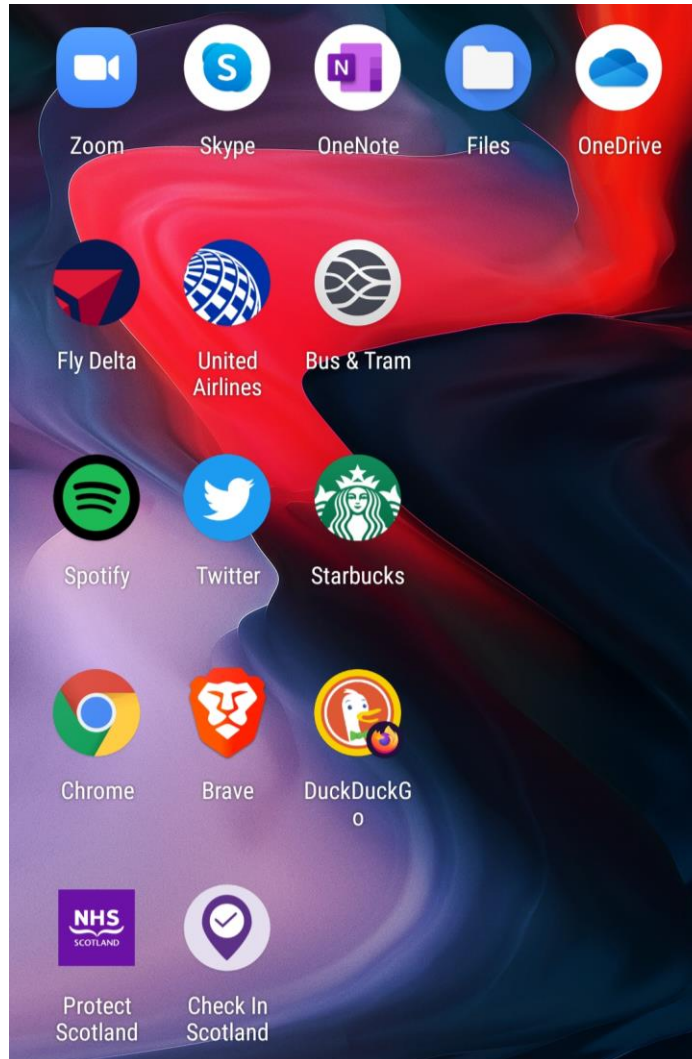
Ordered by color

Aesthetics and minimalist design

- Get rid of clutter
- Easier to see things when there are not piles of other things in the way
- Why
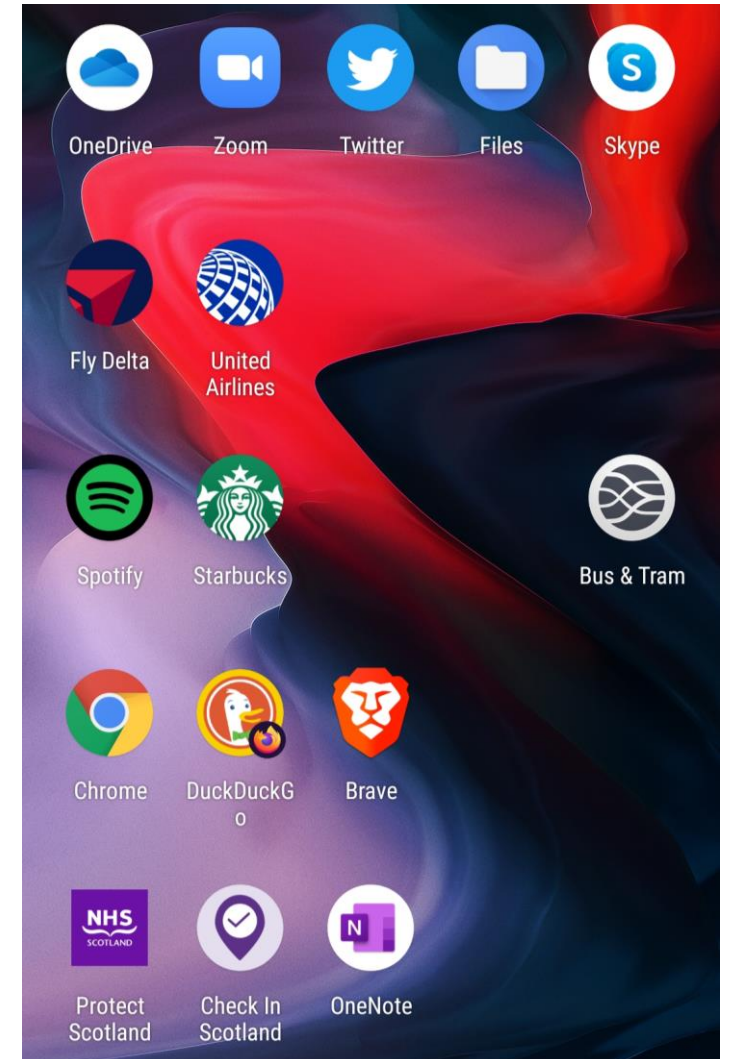 - The more things there are to look at, the harder it is for a user to process the data

Pita sign is busy and unorganized making it challenging to find information.

Bakery sign shows information in two languages while still making information clear.

Good example: clean, clear what user should do

Poor example: busy, lots of links everywhere

Poor example: lots of information and it is poorly organized (good use of colors though).

Help users recognize, diagnose, and recover from errors

- Error messages should be clear, written in plain language, explain the problem, give constructive advice on how to solve the problem.
- Why
  - Errors should only be shown to users when the system can no longer make a choice on their behalf. The error needs to be clear about what it is the user needs to do or provide input on.

Poor example:

Better example: information about what the password is and how to fix it.

OpenWrt

No password set!
There is no password set on this router. Please configure a root password to protect the web interface and enable SSH.
Go to password configuration...

Authorization Required
Please enter your username and password.

Username	root
Password	

▶ Login   ✕ Reset

Powered by LuCI 15.05-142-gb6330a1 Release (git-15.363.78009-956be55) / OpenWrt Chaos Calmer 15.05.1

Oopse... I meant to login and clicked the wrong link.

Designer provided a link back to the sign in though because the anticipated this error. (Good example.)
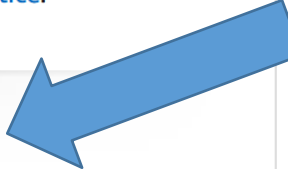
Help and documentation

- Unless the system is extremely simple, some people will need help documentation.
- Provide guidance at the right moment when the user requires it.
- Why
  - People learn about things in different ways. Some people learn by playing around and pushing buttons, other people learn by reading. The system needs to support all people.
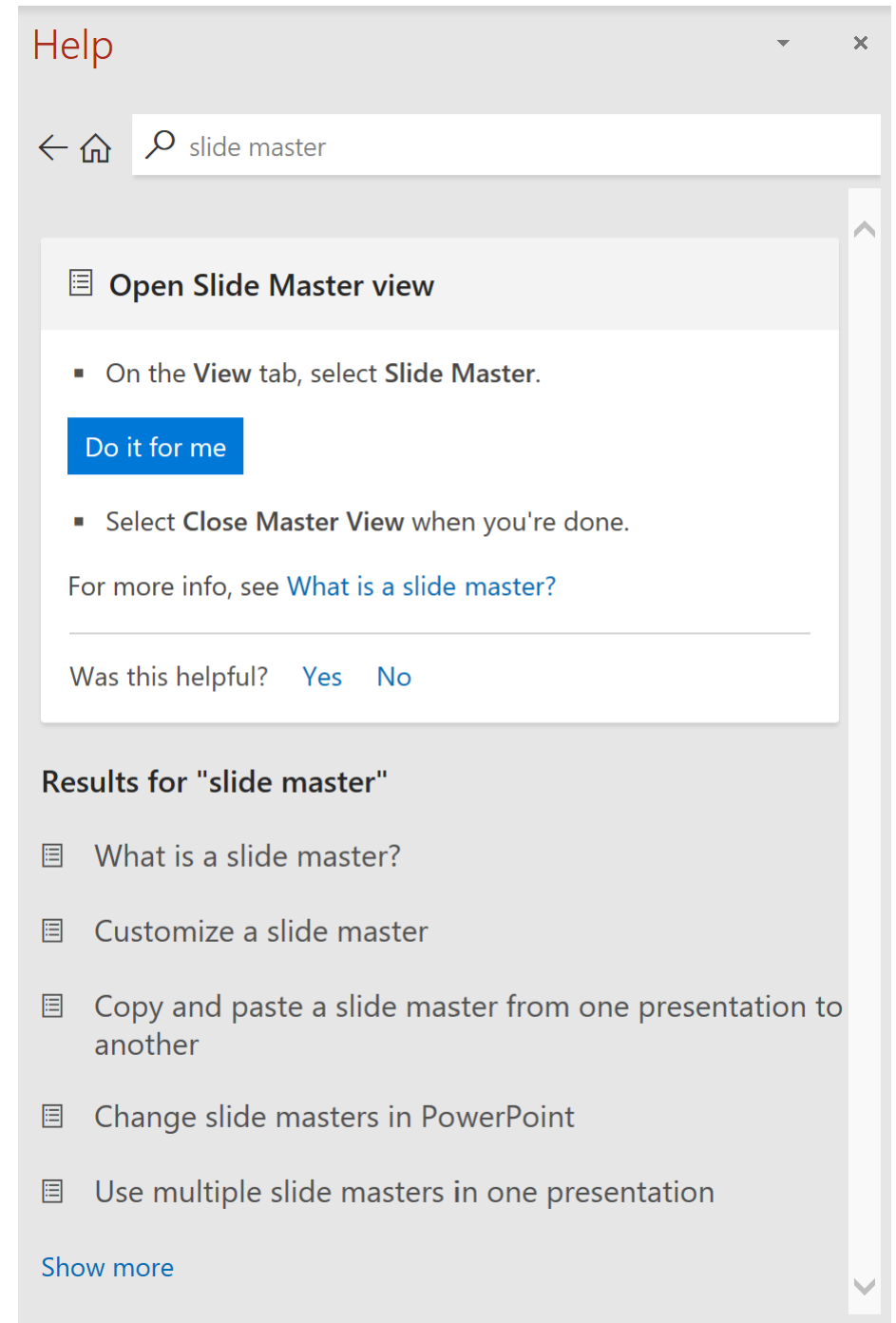
Good help example, poor affordance

Good example: provide guidance where needed

Enter Your Card Details

Credit or Debit Card

Enter Your Card Number *

Expiry Date *:   Valid From:

What is this?

CVV (3 or 4 digit) *

Continue

The payment card details entered above are used only to verify that you are the cardholder. Your information will be secured using the latest encryption technologies in line with PCI data security standards, and will not be stored.

What is this?

Good example: clear instructions on how to add money to the app provided right after installation.

Nielsen's 10 Heuristics

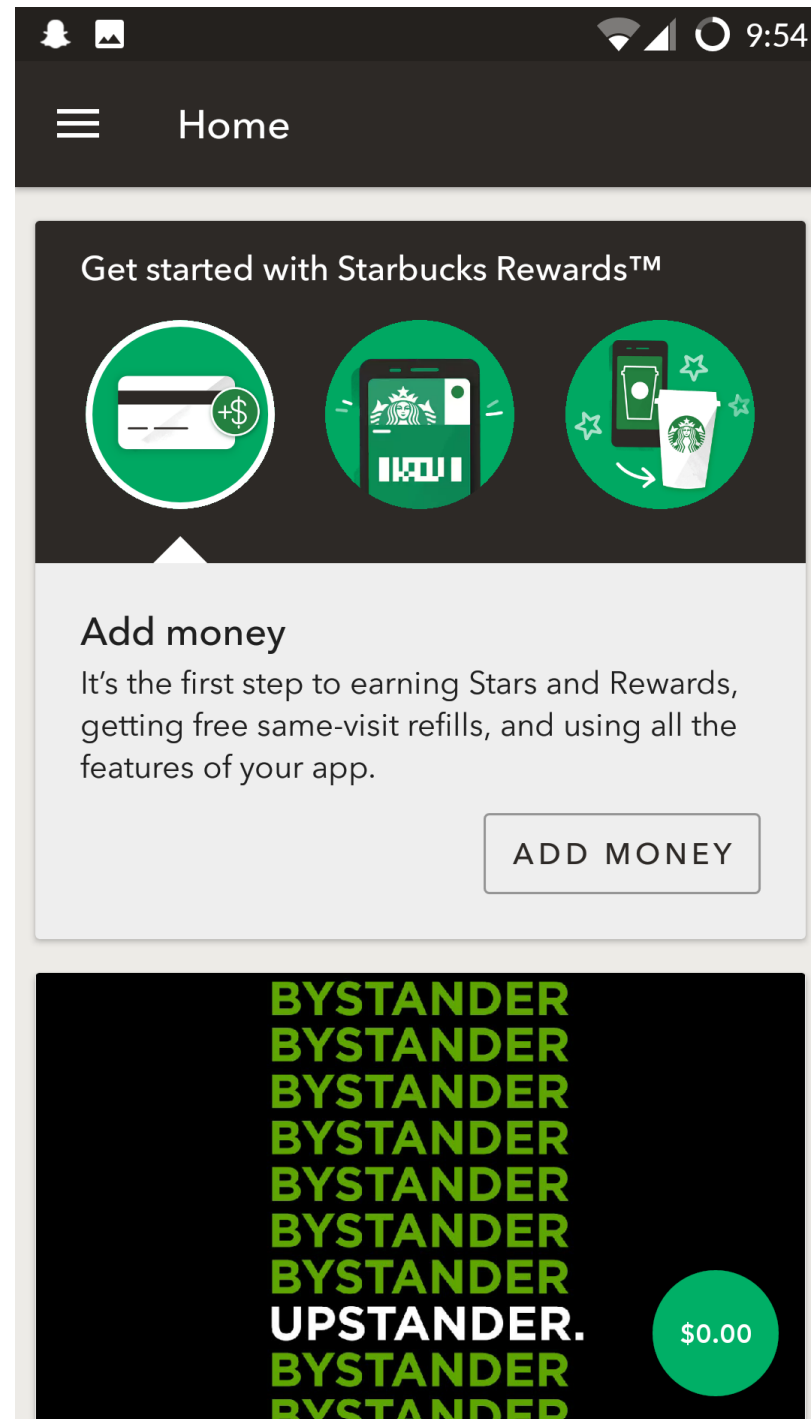"Heuristics" are simple rules that can be easily applied and are true in most situations. Using the ten heuristics to the right we can detect a large percentage of usability issues.

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