Interaction Learnability

User Interface Hall of Shame

IBM's RealCD is CD player software, which allows you to play an audio CD in your CD-ROM drive.

Why is it called "Real"?

Because its designers based it on a real-world object: a plastic CD case.

This interface has a metaphor, an analog in the real world.

Metaphors are one way to make an interface more learnable,
since users can make guesses about how it will work based on what they
already know about the interface's metaphor.

Unfortunately, the designers' careful adherence to this metaphor produced some remarkable effects, none of them good.

Notice that the UI is dominated by artwork, just like the outside of a CD case is dominated by the cover art. That big RealCD logo is just that–static artwork. Clicking on it does nothing.

There's an obvious problem with the choice of metaphor, of course: a CD case doesn't actually play CDs.

Slavish adherence to the metaphor also drove the designers to disregard all consistency with other desktop applications.

Where is this window's close box?

How do I shut it down?

You might be able to guess, but is it obvious?

Learnability comes from more than just metaphor.

Lots more details of its horrible usability here

User Interface Hall of Shame

But it gets worse.

It turns out, like a CD case, this interface can also be opened.

Clicking on the cover art would be a perfectly sensible way to open the case.

Instead, it turns out the only way to open the case is by a toggle button control (the button with two little gray squares on it).

Opening the case reveals some important controls, including the list of tracks on the CD, a volume control, and buttons for random or looping play.

Evidently the metaphor dictated that the track list belongs on the "back" of the case.

But why is the cover art more important than these controls?

A task analysis would clearly show that adjusting the volume or picking a particular track matters more than viewing the cover art.

User Interface Hall of Shame (repeated)

And again, the designers ignore consistency with other desktop applications.

It turns out that not all the tracks on the CD are visible in the list.

Could you tell right away? Where is its scrollbar?

We're not done yet.

Where is the online help for this interface?

User Interface Hall of Shame (repeated)

User Interface Hall of Shame

Source: Interface Hall of Shame

mouse over

Where is the online help for this interface?

First, the CD case must be open.
You had to figure out how to do that yourself, without help.

With the case open, if you move the mouse over the lower right corner of the cover art, around the IBM logo, you'll see some feedback.

The corner of the page will seem to peel back.
Clicking on that corner will open the Help Browser.

The aspect of the metaphor in play here is the liner notes included in a CD case.

Removing the liner notes booklet from a physical CD case is indeed a fiddly operation, and alas, the designers of RealCD have managed to replicate that part of the experience pretty accurately.

But in a physical CD case, the liner notes usually contain lyrics or credits or goofy pictures of the band, which aren't at all important to the primary task of playing the music.

RealCD puts the help in this invisible, nearly unreachable, and probably undiscoverable booklet.

This example has several lessons:

first, that interface metaphors can be horribly misused.

second, the presence of a metaphor does not at all guarantee an "intuitive", or easy-to-learn, user interface.

(There's a third lesson too, unrelated to metaphor–that beautiful graphic design doesn't equal usability, and that graphic designers can be just as blind to usability problems as programmers can.)
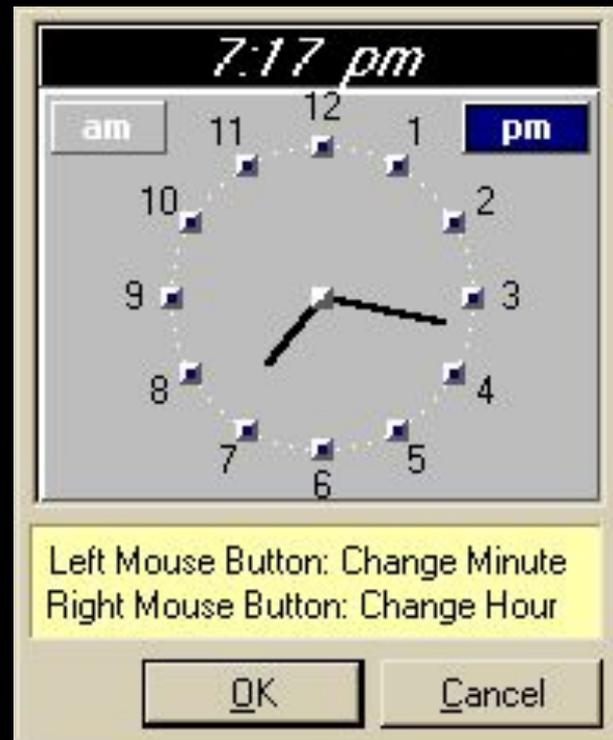
Fortunately, metaphor is not the only way to achieve learnability.

In fact, it's probably the hardest way,
fraught with the most pitfalls for the designer.

More UI Hall of Shame

Here's another bizarre interface, taken from a program that launches housekeeping tasks at scheduled intervals.

The date and time look like editable fields (affordance),
but you can't edit them with the keyboard.

Instead, if you want to change the time, you have to click on the Set Time
button to bring up a dialog box.

This dialog box displays time differently, using 12-hour time (7:17 pm)
where the original dialog used 24-hour time (consistency).

Just to increase the confusion, it also adds a third representation, an
analog clock face.

So how is the time actually changed?

By clicking mouse buttons: clicking the left mouse button increases the minute by 1 (wrapping around from 59 to 0), and clicking the right mouse button increases the hour.

Sound familiar?

This designer has managed to turn a sophisticated graphical user interface, full of windows, buttons, and widgets, and controlled by a hundred-key keyboard and two-button mouse, into a clock radio!

Perhaps the worst part of this example is that it's not a result of laziness.
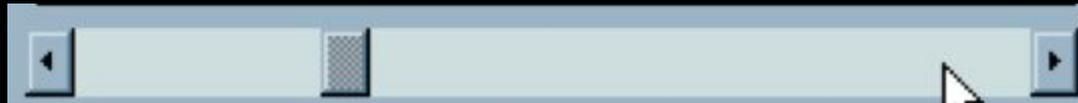
Somebody went to a lot of effort to draw that clock face with hands.

If only they'd spent some of that time thinking about usability instead.

Affordances and Signifiers

Affordances

- Actual properties of a thing that determine how the thing could be used
- Depend on **thing** and **you**

Signifiers

- Hint/indication of an affordance
- Should match true affordances

- Affordance refers to the actual properties of a thing, primarily the properties that determine how the thing could be operated.
- Chairs have properties that make them suitable for sitting.
- Signifier refers to perceived properties of a thing that hint at an affordance.
- doorknobs are the right size and shape for a hand to grasp and turn.

- A button's properties say "push me with your finger."
- Scrollbars say that they continuously scroll or pan something that you can't entirely see.
- Signifiers are how an interface communicates nonverbally, telling you how to operate it.
- Signifiers are rarely innate – they are learned from experience.
- We recognize properties suitable for sitting on the basis of our long experience with chairs.
- We recognize that listboxes allow you to make a selection because we've seen and used many listboxes, and that's what they do.

- Note that signifiers can lie about affordances.
- A facsimile of a chair made of papier-mache has a signifier for sitting, but it doesn't actually afford sitting: it collapses under your weight.
- Conversely, a fire hydrant has no signifier for sitting, since it lacks a flat, human-width horizontal surface, but it actually does afford sitting, albeit uncomfortably.
- Recall the textbox from the alarm clock, whose signifier (type a time here) disagrees with what it can actually do (you can't type, you have to push the Set Time button to change it).

- Don Norman, who originally imported the psychology term affordance into design and HCI, and popularized it with his wonderful book [The Design of Everyday Things](), now regrets the confusion of using the same word, "affordance", for both the perception of use and the reality of use.
- He proposes that signifier as a better word for a perceived affordance, so that affordance can be reserved for actual affordances, as in psychology.
- (Don Norman, "[Signifiers, not affordances]()", Interactions 2008).

Note: Slides are derived from this book.

REVISED & EXPANDED EDITION
The DESIGN of EVERYDAY THINGS
DON NORMAN
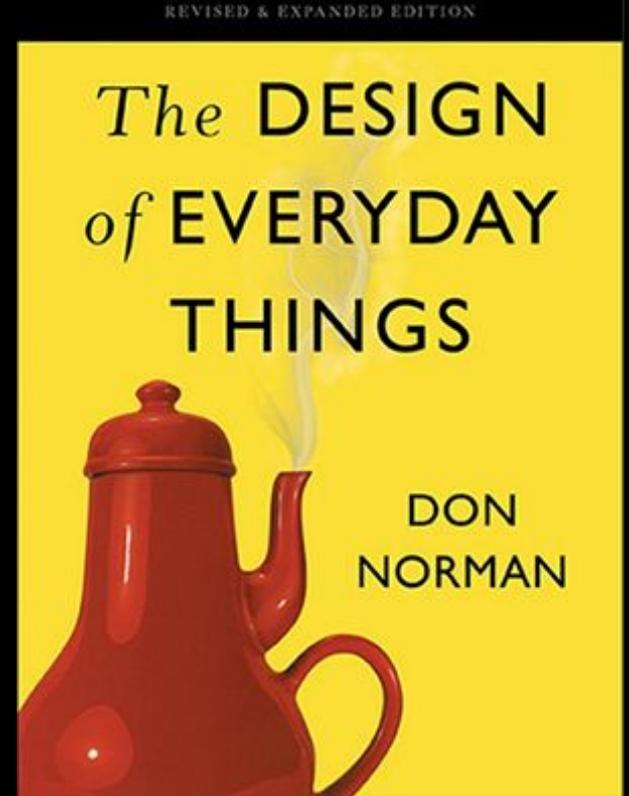
Here are some more examples of commonly-seen signifiers in graphical user interfaces.

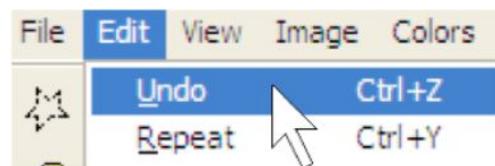- Buttons & links
- Drop-down arrows
- Texture
- Mouse cursor
- Highlight on mouseover

- Buttons and hyperlinks are the simplest form of affordances (and signifiers) for actions.
  - Buttons are typically metaphorical of real-world buttons, but the underlined hyperlink has become a signifier all on its own, without reference to any physical metaphor.
- Downward-pointing arrows indicate that you can see more choices if you click on the arrow.
  - The arrow actually does double-duty – it makes visible the fact that more choices are available, and it serves as a hotspot for clicking to actually make it happen.
- Texture suggests that something can be clicked and dragged
  - relying on the physical metaphor, that physical switches and handles often have a ridged or bumpy surface for fingers to more easily grasp or push.
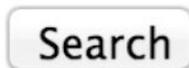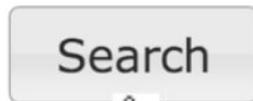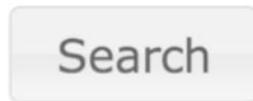
Evolution of Hyperlinks and Buttons

- Hyperlinks and buttons have evolved and changed significantly.
- The top row shows how hyperlinks and buttons looked circa 1995
  - on NCSA Mosaic, the first widely-used web browser, which used the Motif graphical user interface toolkit.
- What properties did they have that distinguished them and made them clickable?
- Which of those properties have been lost over time, presumably as users become more familiar with these objects?

What's Wrong With This?

Signifiers depend on User & Culture

WALKMANS

Studio

Studio - CSS Diner

- Practice CSS selectors by playing around with CSS Diner.
  - https://flukeout.github.io/

Studio - Macy's

- The purpose of this studio work is to think different which is so challenging in Web Design.
- Suppose you want to buy a top at Macy's (Women -> Tops).
  - https://www.macys.com/
- Choose your favorite color, fabric material, and the desired price range. Then choose your size(s)— Macy's carries a variety of brands which are not always consistent in sizing with each other. So you could be a size 6 in a brand, and a size 8 in another. Choose women's regular sizes 6 & 8, as well as petite sizes 6P and 8P.
- How efficient did you find the process? What was efficient and what wasn't?
- How would you change the UI to support the user in being more efficient at filtering through items?

Studio - JOANN

- Suppose you want to buy **Halloween decor** at JOANN. Play around with the price filters.
  - https://www.joann.com/
- How efficient is it to select your desired price range for the items? What about the current price filters works well and what doesn't?
- How would you change the UI to make the price selection process more efficient?
- What are the trade-offs of your suggested design vs the current design of the website?