Software Affordances


**Affordance** - the perceived and actual properties of a thing.

When everyday things that have been used for decades or longer (doors, switches, knobs, ...) vary in their affordances - what is the affordance of software?

Affordance and Interface Style

What does a command line prompt afford?

state = ready for next command

What does a menu afford?

selection of item for display or traversal

What does the desktop metaphor afford?

scrollbars, pull down menus, buttons, mice...

What does a car fob afford?
Physical and Digital Affordances

3 Physical Affordances

Perceptible affordance is the basic definition of affordance, where an object’s characteristics imply an action. Tea cup is small can have steaming hot content and has a handle, which affords holding/driving w/o getting burned. Intuitively obvious.

Hidden affordance is when an object has affordances that are not obvious. A mouse can be used to move an on-screen cursor. Learned.

False affordance is when there is a perceived affordance; but no results happen from the possible action. Door has a pull handle but needs to be pushed to open.
6 Digital Affordances

Explicit affordance like perceptible affordance, explicit affordance. A raised button implies ‘Click me’, it’s fairly obvious.

Pattern affordance is set by conventions. A great example would be a logo that’s at the top left corner of a webpage being clickable. It’s a pattern we see everywhere; so we expect it everywhere. Text that is different color, sometimes maybe underlined or italic, among unchanged body text like a paragraph, is assumed to be a link. Email is often represented with an envelope, while settings are represented with a gear.

Hidden affordance in digital designs is similar to that of physical objects. In the digital world, however, the actual affordance isn’t available until an action has been taken to reveal it. For instance, hovering over a button to see whether to not it’s active, and therefore clickable.
False affordance affords something else that is unexpected. False affordance is most plentiful in designs where details have been missed; a broken link situation. Colors have specific associations with them. In the western world, green is good while red is bad. When you switch the two, you will most certainly confuse some of your users,

Metaphorical affordances, like imitations of real objects, to communicate. Icons are wonderful examples of this: map, shopping cart or basket.

Negative affordance indicating no affordance; an inactive button or a link is greyed out.
Affordances of user control & objects

User controls consist of interface options. On a desktop they are menus (pulldown or popups), scrollbars, cursors. Objects are items manipulated.

Controls should indicate their state - are they affordable. Objects should indicate their selection.

   Menu items inactive: invisible or grayed, active: checked.

   Icons, iconic buttons, or graphic menu items suggest the functionality they afford.

   Cursors indicate state. I beam enter text, hand to move

Most likely next operation should be highlighted

On a dialog the most common response should be selected for user acceptance

Selected Objects should be highlighted.
Display User Wear

Physical objects display wear from their use. The more use the more wear...

Examples of wear affordances in reference manuals: "dog eared" pages are most used book opens to pages most often read book marks allow quick

standard scrollbar: thumb position

edit wear on text file width of histogram indicates magnitudes of edit on that line

Two edit histories (two histograms - group work)

Total edit wear of file

Edit wear of different edit operations.

Concept has been included in IDE editors
Menu Wear

Menu selectors (tags) could show use.

Users could select options with wear affordances.

Here shading indicates wear.
Spreadsheet Wear

Spreadsheet row, columns, cells could illustrate wear as well as values.

Wear could illustrate the frequency of cell changes.

Edit Wear - Read Wear

1. Documents use public
2. Shows "informational physics" of document.
3. Increase collaboration among users
4. Indicate places for updates
Visual Studio 2015 edit scroll pane

Boxes used to show % text file with attribute
Lines used to show position in text file

Scroll pane display attributes
• current thumb position (gray box)
• comment blocks and (green box)
• break points (red box)
• current selected text (blue bar)
HyperMedia

Hyper media is a cross of embedded menus and direct manipulation interface styles. Hyper media is usually multi media (text, graphics, & sound) -- Web is hypermedia

In hyper media an object (words, diagram items...) are selection items in an acyclic menu.

Hyper media documents are useful in:

- information retrieval: help systems, databases, on-line documentation, encyclopedias
- teaching software: learn by exploration
- fiction: reader structured novels, e-books
- end user programming environments & applications
  (3D modelers, Interface Designers/Builders)

Information Visualization lecture cover more graphical affordances (some negative).
2 Hyper Media HCI issues

Links (selection) - How does the user know what items provide links to additional information (displays)?

Highlighting links (or surrounding links in a box) can be obtrusive to document. Graphics items are not regular (highlights become ambiguous).

What items should be made links? (know the document's task and know the user)

Navigation - Users can become lost in network and networks maybe difficult to learn (consistency?).

- navigational maps (global map, local map)
- forward, backward, navigational bars

Exploit semantics of document's semantics and user's knowledge of task (information).
The 2015 BMW i8 may feature a computerized smartkey: high-resolution LCD screen displays the charge left in the car, the current range, when it was charged last and whether it’s locked. The key fob has a docking spot in the dashboard to recharge it.
some Google code information visualizing projects

table lens visualizer

version control visualization
3D Web

cubic eye

MS SurroundWeb

3D Web Browser (Apple)

Chrome 3D (red/blue)
Cave video
cave wiki
Intelligently facilitates a user's information processing task's.

Models the user and predict user tasks.

Models the task, and task objects.

Agents Vs objects

- Agents are more autonomous than objects.
- Agents have flexible behaviour, reactive, proactive, social.
- Agents have at least one thread of control but may have more.

Agents Vs expert systems

- Expert systems are not coupled to their environment;
- Expert systems are not designed for reactive, proactive behavior.
- Expert systems do not consider social ability