software studio

usability heuristics

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why UX matters
UX for quality of life

Dieter Rams, 1958
pocket transistor radio T3

Alfonso Bialetti, 1933
La Moka coffee maker

Leica, 1953
M3 rangefinder camera
everything needs UX design
bad UX may lead to total failure

“While the new system based on software supplied by SAP AG worked as planned, it was so burdensome and disruptive to the representatives’ daily routine that they left in meaningful numbers.”

Avon spokesperson
WSJ blog take on Avon failure

Avon is pulling the plug on a $125 million software system rollout that has been in the works for four years after a test of the system in Canada drove away representatives the door-to-door beauty product company relies on to drive sales...

The failure of Avon Products $125 million implementation of SAP software is the latest – and perhaps most dramatic – example of how usability has become a critical issue in the workplace. People who are accustomed to using simple, well-designed applications in their personal lives have no patience for disappointing technology at work...
UX is a product differentiator

the $1000 phone
UX criteria
ease of use
easy to use

learnable

efficient

error-tolerant
example: signatures in Apple Preview

learnable? yes, as good as it gets
efficient? yes, but not very flexible
error-tolerant? yes, feedback as you position it
example: car radio presets

**learnable?**  not really: who would guess?

**efficient?**  yes, perfect

**error-tolerant?**  unless you lean on a button
example: dropbox deletion

learnable? yes, but might not mean what you think

efficient? yes, just click a button

error-tolerant? no: deletes other users’ copies too!
learnability vs efficiency

- Professional photo editing application (e.g., Photoshop)
- Easy to use photo editing application (e.g., Pixlr)
pleasantness
example: pleasantness in architecture

Ryōan-ji, Kyoto
example: the light phone

“A credit card-sized cell phone designed to be used as little as possible. The Light Phone is your phone away from phone.”
amber case: calm tech evangelist
some calm tech principles

require least attention possible
communicate without noise
respect social norms
minimal technology needed
use the periphery
safety
what's safety for?

safety-critical products

regular products
interlocks, not just messages

Heathrow Airport
an infusion pump

Thimbleby et al: http://cs.swan.ac.uk/gcsharold/health/
Infusion pumps, including the Baxter Colleague models, have been the source of persistent safety problems. In the past five years, the FDA has received more than 56,000 reports of adverse events associated with the use of infusion pumps. Those events have included serious injuries and more than 500 deaths.
more designs that killed people

Panama City Hospital, 2001  
Multidata therapy planning system  
kills 18 patients

PLUGR, Afghanistan 2001
discussion: car gears
Managers are now aware of the problem of entering zero into database fields and are trained to bypass a bad data field and change the value... ships do go dead in the water... People sometimes make mistakes and systems break. The trick is we have trained our crew...

— Commanding Officer, USS Yorktown
security
conflicting goals

MORDAC, THE PREVENTER OF INFORMATION SERVICES.
SECURITY IS MORE IMPORTANT THAN USABILITY.

IN A PERFECT WORLD, NO ONE WOULD BE ABLE TO USE ANYTHING.

To complete the log-in procedure, stare directly at the sun.
why johnny can’t encrypt

study of 12 users of PGP email encryption
1 unable to encrypt at all
3 sent secret without encryption -- 2 knowingly
7 used the wrong key, so impossible to decrypt

Alma Whitten and J. D. Tygar, Why Johnny can't encrypt: a usability evaluation of PGP 5.0, 1999
From: "TIG" <help@MIT.EDU>
Date: October 13, 2008 11:04:08 AM EDT
To: "Daniel Jackson" <dnj@csail.mit.edu>
Subject: your password

We recently ran a password checker to evaluate passwords of all CSAIL users, and your password was readily broken. Please choose a new password ASAP...

my password:
sergeantpepper1967
8 character UNIX limit: truncated after this
a common password policy

ACTION REQUIRED TO RETAIN ACCESS TO APPLICATIONS VIA THE INTERNET SUCH AS EMAIL, WEB SITES AND REMOTE DIAL UP

Company provides the ability to access various applications via a Company ID and password. Your password expires every 75 days.

This reminder is being sent as it has been 60 days since your last password change.

If you do not change your password within the next 15 days, your password will expire and you will lose access to company applications.

From: admin@company.com
Sent: Friday, January 09, 2011 4:43 PM
To: consultants
Subject: your passwords

I have updated all the passwords for you.

New Password: Company1
IDs affected: jackson, smith, doe
accessibility
red-green colorblindness affects 8% of men
example: colorblindness

simulated with SEE Chrome plugin
web accessibility guidelines

provide text alternatives to images

keyboard accessible

offer captioning of video content

See: Web Accessibility Initiative, http://www.w3.org/WAI
lessons

ease of use: conflicting goals
pleasantness: we’re not machines
safety: usability means constraints
security from usability & usable security
accessibility: important & beneficial to all
exercise: subway turnstiles

yellkey.com/memory

give example of issue of
learnability
efficiency
error tolerance
pleasantness
safety
security
accessibility
the role of heuristics & user testing
user interaction levels

- Physical
- Linguistic
- Navigational
- Conceptual

discussed last week

design first, before UI
a more complete process

- need finding
  - crystallize product purposes

- concept design
  - invent concept purpose
  - review known concepts
  - polish concept design

- interface design
  - design user interface
  - review known elements
  - apply heuristic evaluation

- testing
  - user studies & tests
why prototypes aren’t enough

waste testing effort
may never converge
leave uncaught serious flaws
physical level
concerns of the physical level

touch, sight, sound

design of interface
where to put buttons
when to show progress bar
what colors to use

human characteristics
time to move mouse?
perception of delay?
sensitivity of the eye?
fitts’s law

heuristic:
keep features close
keep features large

time to move to target \( T = a + b \log(D/W + 1) \)

reaction time \( a \) is fixed

moving time depends on ‘index of difficulty’ \( D/W \)

for demos, see http://fww.few.vu.nl/hci/interactive/fitts/
and http://simonwallner.at/ext/fitts/
example: closing app on iPhone
exercise: windows vs mac

“On Windows the menu bar is right there, no need to move your eye to another part of the screen.”

An online argument. Is he right? What does Fitts’s Law say?
applying Fitt: Windows vs Mac

the Mac menu is a bit further away, but it effectively has infinite size, so it’s much quicker to locate
perceptual fusion

stimuli within 100ms are fused
less than this feels instantaneous

heuristics:
avoid delays > 0.1s
for longer, show progress

an early flipbook

progress bar
gestalt principles of grouping

design lesson:
use visual layout
to convey structure
example: aggregate actions
to be continued...

next time
the linguistic and navigational levels