perfection is reached not when there is no more to add but when there is no more to take away

Antoine de St. Exupéry
29 June 1900—31 July 1944, writer, aviator

an invention is not a product

2.009 Product engineering processes
2.009 Product engineering processes today

product form organizing a product, making it understandable, making it coherent

thinking about designing this week
2.009 Product engineering processes today

products that are pleasing

unlike this!
but first…

words to avoid in a critique

- checking the ego
- insults
- judgements
- sales
- fantastic, awesome

- my/mine/our
- you/yours
- stupid
- bad/awful
Mini quiz

Drill reverse engineering circuits with the desired behavior…
Mini quiz
drill reverse engineering
circuits with the desired behavior…

John Bell
Nate Johnson
Hind Saleh
Lindsay Epstein
Drew Beller
Travis Libsack
Bibit Bianchini

a chair is to sit on…
curiosity and design
Mini quiz

a pledge

I will remain intellectually curious
Mini quiz
yep, another one!

identify two types of product architectures

list one advantage and disadvantage of each architecture

what is an ethic?

what does form follows function mean?
Form and human use

form follows function: Louis Sullivan

“form instructs user”
Form and human use

form follows function

obvious articulation avoids damage

circles, positive and negative forms imply motion
Form and human use
form follows function

positive and negative forms imply motion
Form and human use
form follows function

objects separate on parting lines
obvious articulation avoids damage
parting lines are have design detail too!
Form and human use
form follows function
understand ergonomic needs
Form and human use
form follows function

direct metaphors in interfaces are better

understand color associations
Form and human use
form follows function
avoid mixed messages, arbitrary details
Form and human use

form follows function

black recedes, conceals
Form and human use

form follows function

smooth invites touching

don’t touch nasty bits
Form and human use
form follows function

communicate key attributes
Form and human use
form follows function

think about possible misuse
form follows function
communication and affordances
simplicity
Making products simple
perception and the principle of pragnanz
Making products simple
perception and the principle of pragnanz
Making products simple
perception and the principle of pragnanz
Making products simple
perception and the principle of pragnanz

so simple
Making products simple
perception and the principle of pragnanz

so complex
KISnS
keep it simple, *NOT* stupid

manage communication and affordances
Principle of Pragnanz
it’s the tool for how to do it!

KISnS
keep it simple, NOT stupid
Principle of Pragnanz
once the template is established...
Principle of Pragnanz
once the template is established…

exceptions are accents!
Principle of Pragnanz
once the template is established...

exceptions are accents!
no arrow needed
it’s a parting line!
KISnS

manage communication and affordances

unnecessary = more ways to go wrong!
Making products simple
invisible objects and the principle of pragnanz

Kanizsa illusion
Making products understandable
invisible objects and the principle of pragnanz
design example: the WWF
Making products simple
positive/negative space and the principle of pragnanz
Making products simple
positive/negative space
Making products simple
positive/negative space
Making products simple

positive/negative space
mini me, you complete me
form follows function

instruct the user

KISnS
2.009 Product engineering processes

Friday

design for assembly

happy decision-making!