2.009 Product engineering processes

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
2.009 Product engineering processes today

product form organizing a product,

making it understandable,

making it coherent
2.009 Product engineering processes
today

tutorials

Multi-user assemblies in SW, 5 PM in Papplardo
Misumi discount program, 5 PM in 3-333
but first…

words to avoid in a critique

- insults
- baldy
- short
- poop
- sales
- perfect
- revolutionary
- potato
still first!

A one minute mini quiz

write your name on index card

write the name of your product

write one well-formulated need-attribute-specification for your product
Mini quiz

drill reverse engineering

circuits with the desired behavior…

Laura Standley
Ian Tolan
Luther Banner III
Valentina Chamorro
Hannah Heffmann
Pedro Brito
Eric Shirley
Conrad Sanborn
Fernando Cunha
Jarrod Smith
Joshua Born
Eric Kline
Jacob Rothman
Amado Antonini
Teddy Ort

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

ea pledge

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

identify two types of product architectures

list one advantage and disadvantage of each architecture

what is an ethic?

what does *form follows function* mean?
2.009 Product engineering processes today

**product form** organizing a product, making it understandable, making it coherent
2.009 Product Engineering Processes

it’s not just about doing

it’s about thinking about what you are doing
Form follows function
form-giving philosophy
Making products understandable
perception and the principle of pragnanz
Making things understandable
perception and the principle of pragnanz
Making products understandable
positive/negative space and the principle of pragnanz

Kanizsa illusion
Making products understandable
positive/negative space and the principle of pragnanz
Giving form to products

a recipe

structure  surface  details/color  graphics
Giving form to products
a recipe

structure  surface  details/color  graphics
Unified structure
Proportions (Le Modulor: Corbusier)

fundamental Unit = 1 Wallydraigle = 1.18 m
fundamental Number = 1.6 Wallydraigles (a feeble, imperfectly developed, slovenly creature)
Unified structure
combinatorial panel exercises
Unified structure
common, preferred proportions

golden section
1.618

1
3
4
5

3
4
5

3
5

5
4

1
2
Unified structure

principle directions
Unified structure
principle directions set expectations: motion?
Giving form to products

a recipe

structure  surface  details/color  graphics
Surface
what brand are we?

the feeling
Surface

a collection of transitions

strong influence on perceived nature of a product
Surface

coherence of a product

form vocabulary, corner treatment hypothesis
Giving form to products

a recipe

structure  surface  details/color  graphics
Details and base color

Refine expectations

weight

portability
Details and base color
implies relationships through grouping
Proximity
Similarity
Continuation
Common region
Connectedness
Closure
Ergonomics at work. For instance, in the development of a new concept for the operation of a fork-lift truck. Based on extensive research into workplace requirements, all essential functions and controls were integrated within a single, tightly compact and easily accessible control panel optimised for heavy-duty, long-term use.

In fact, we look back on more than 30 years of exceptional success in the field of international industrial design. Our teams create products which generate an aggregate annual turnover of DM 10 billion for the companies which seek our services. And we have reaped over 600 national and international design awards in the

Proximity
Similarity
Continuation
Common region
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Proximity
Similarity
Continuation
Common region
Connectedness
Closure
Giving form to products

a recipe

structure
surface
details/color
graphics
textures, fonts, logos, graphic layout
Graphics

color accents

manage focus

imply orientation
Graphics

color accents and visual balance
Giving form to products

systematic approach but ...

observe and pay attention to detail

illusions are commonplace

actual geometry

perceived geometry
open and closed forms

Line length

Muller-Lyer illusion
object size

Perspective perception

Ponzo illusion

Ames room
café wall illusion

Parallel or not?
peripheral drift (1990s)
if something’s rotating – go home, you need a break!