



Materials in Industrial Design:

Why do consumers buy products?

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Learning objectives for this lecture unit

Intended Learning Outcomes	
Knowledge and Understanding	Understanding of Industrial Design attributes
Skills and Abilities	Ability to analyze product character
Values and Attitudes	Reflection on product value, character and personality

Resources

- **Text:** “Materials and Design, the Art and Science of Materials Selection in Product Design”, 2nd edition, by Mike Ashby and Kara Johnson, Butterworth Heinemann, Oxford UK, 2010.
- **Text:** “Materials Selection in Mechanical Design”, 4th Edition by M.F. Ashby Butterworth Heinemann, Oxford, 2011, Chapter 16.
- **Poster:** [Industrial Design](#)

Outline



- **Why is Industrial Design important?**
- **What gives a product its character?**
- **Making charts for sensory properties**
- **Design: creating associations and perceptions**

Product value

A product has a

cost C *the true **cost** of manufacture, marketing etc.*

price P *the **price** at which it is offered to the consumer*

value V *what the consumer thinks it is **worth***

Product success requires that
 $C < P < V$

*My Parker pens,
8 euros each*



*Do they write 375
times better ?*

*Parker special
edition 3000 euros*



*What determines **cost** ?*

Technical design, materials, processes, labour

***price** ?*

Cost plus margin

***value** ?*

Both technical and industrial design;

*-- **aesthetics, associations, perceptions***

Why does Industrial Design (ID) matter ?

Product maturity and market saturation

- In a crowded market ID allows differentiation and consumer-group targeting

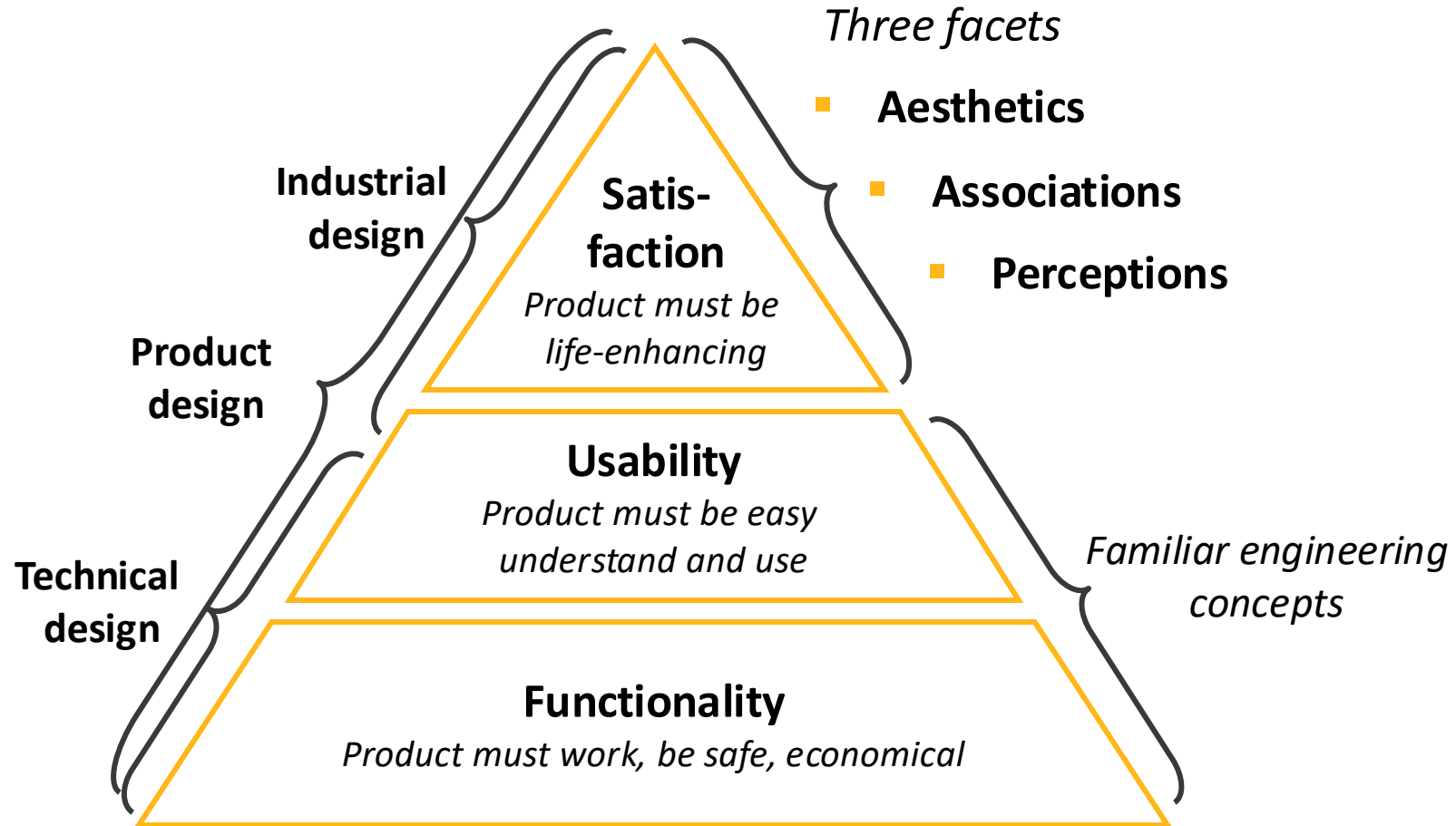
Corporate identity

- ID creates corporate image
- ID creates brand loyalty

The environment, in the broadest sense

- ID contributes to quality of life

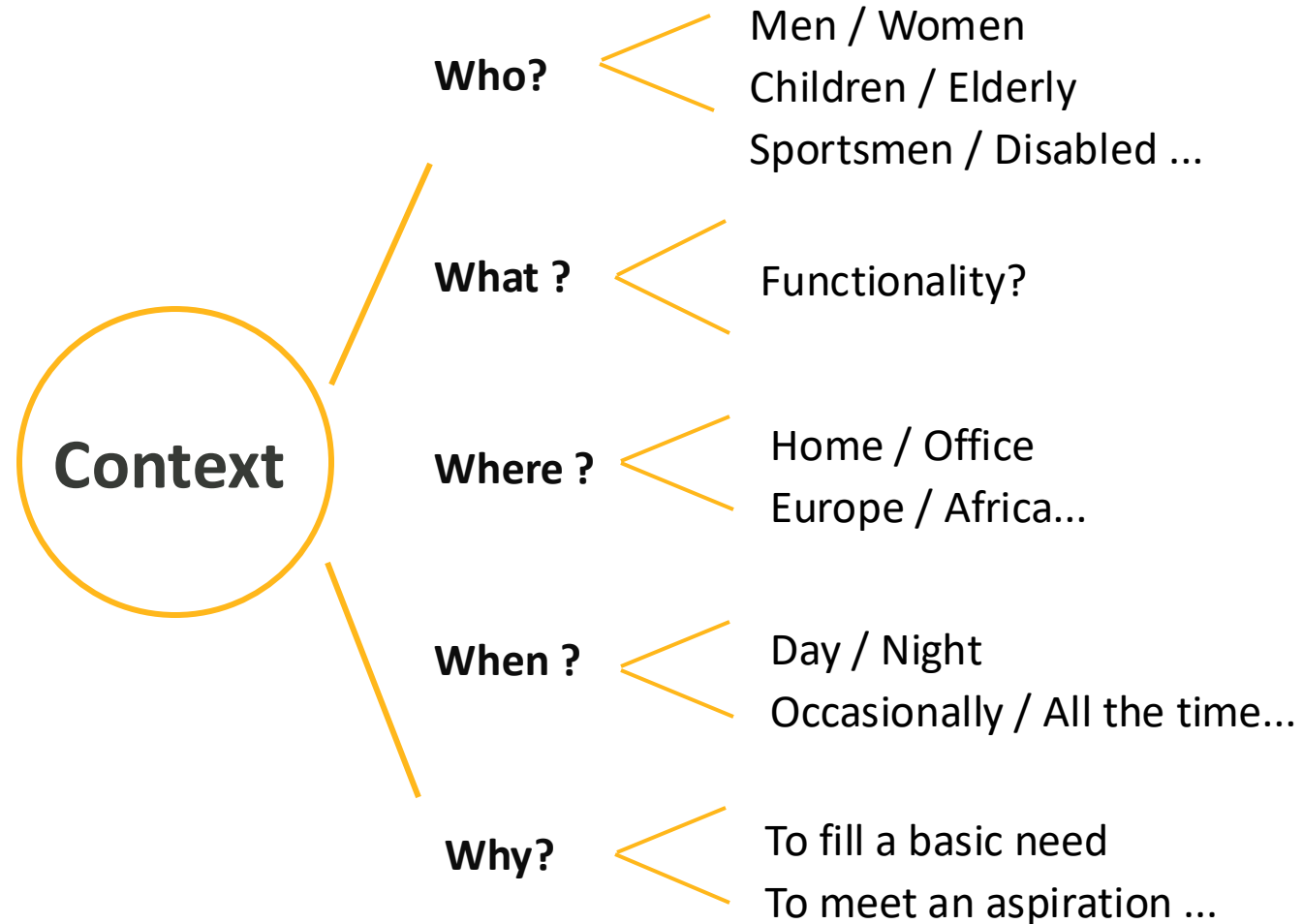
Product design



What gives a product its character?

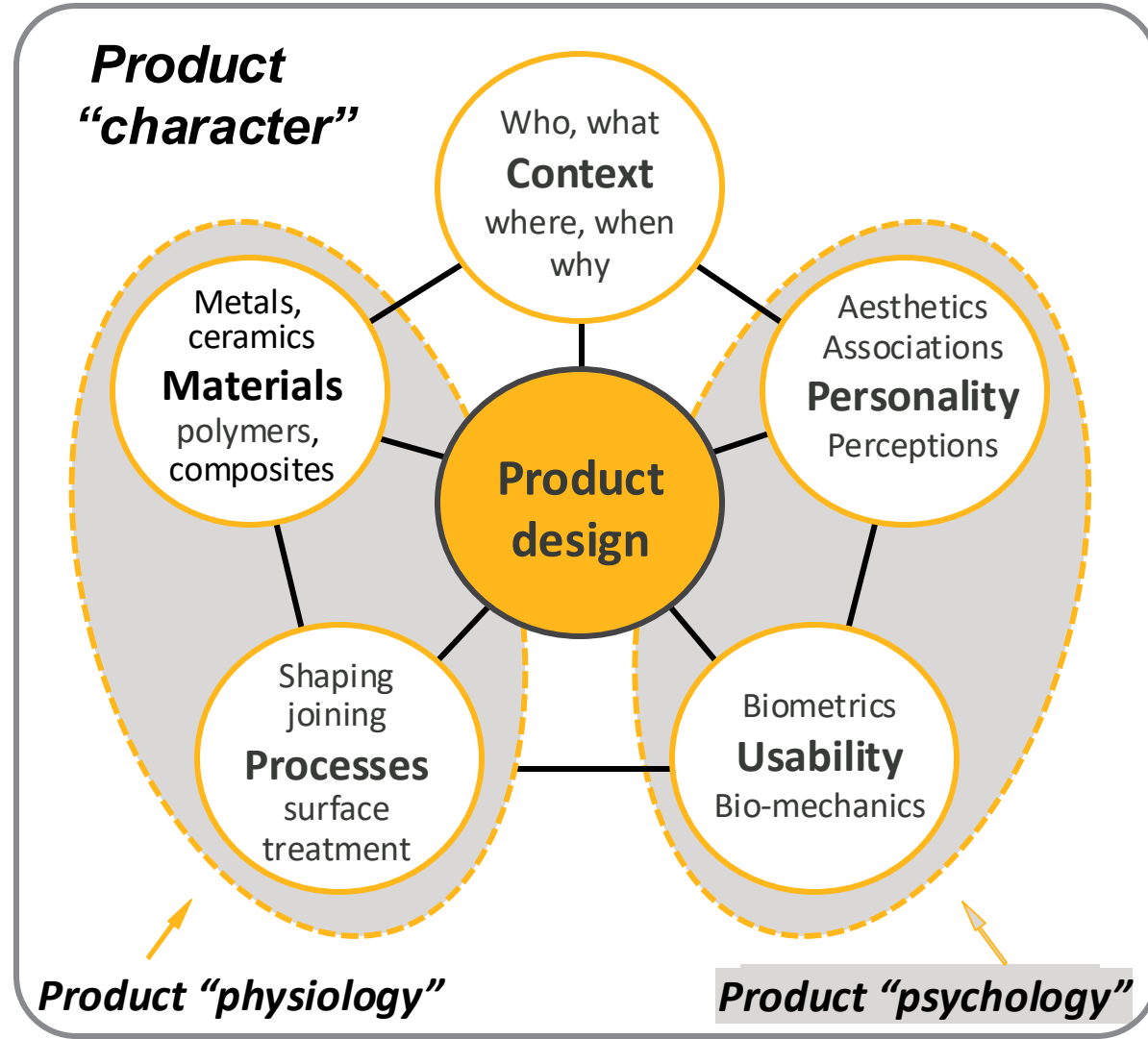


Establishing the context

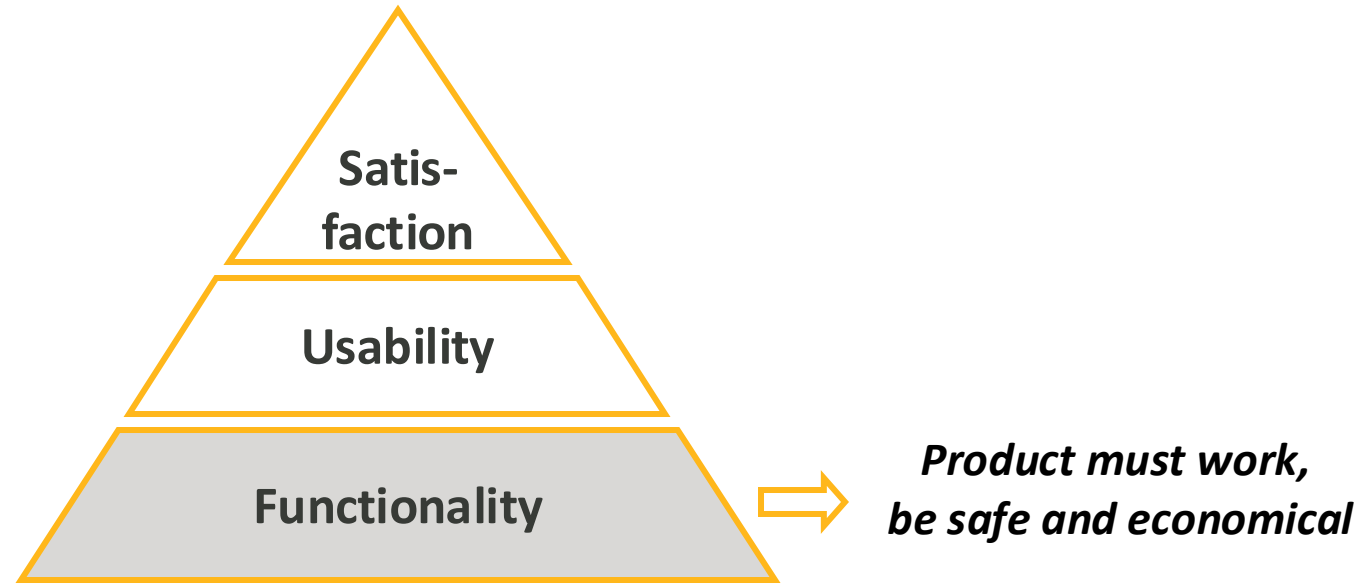


These set the **MOOD**

What gives a product its character?

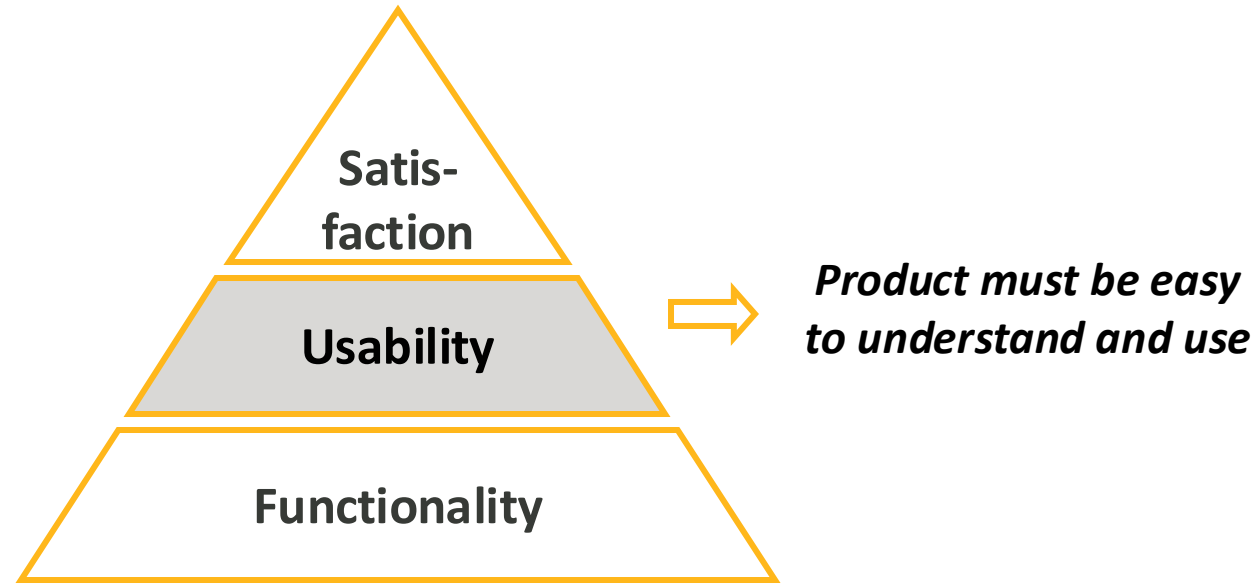


Technical and industrial design



- Sound technical design
 - Proper choice of materials
 - Proper choice of manufacturing process
- } Plenty of tools to do this

Usability (“ergonomics”)

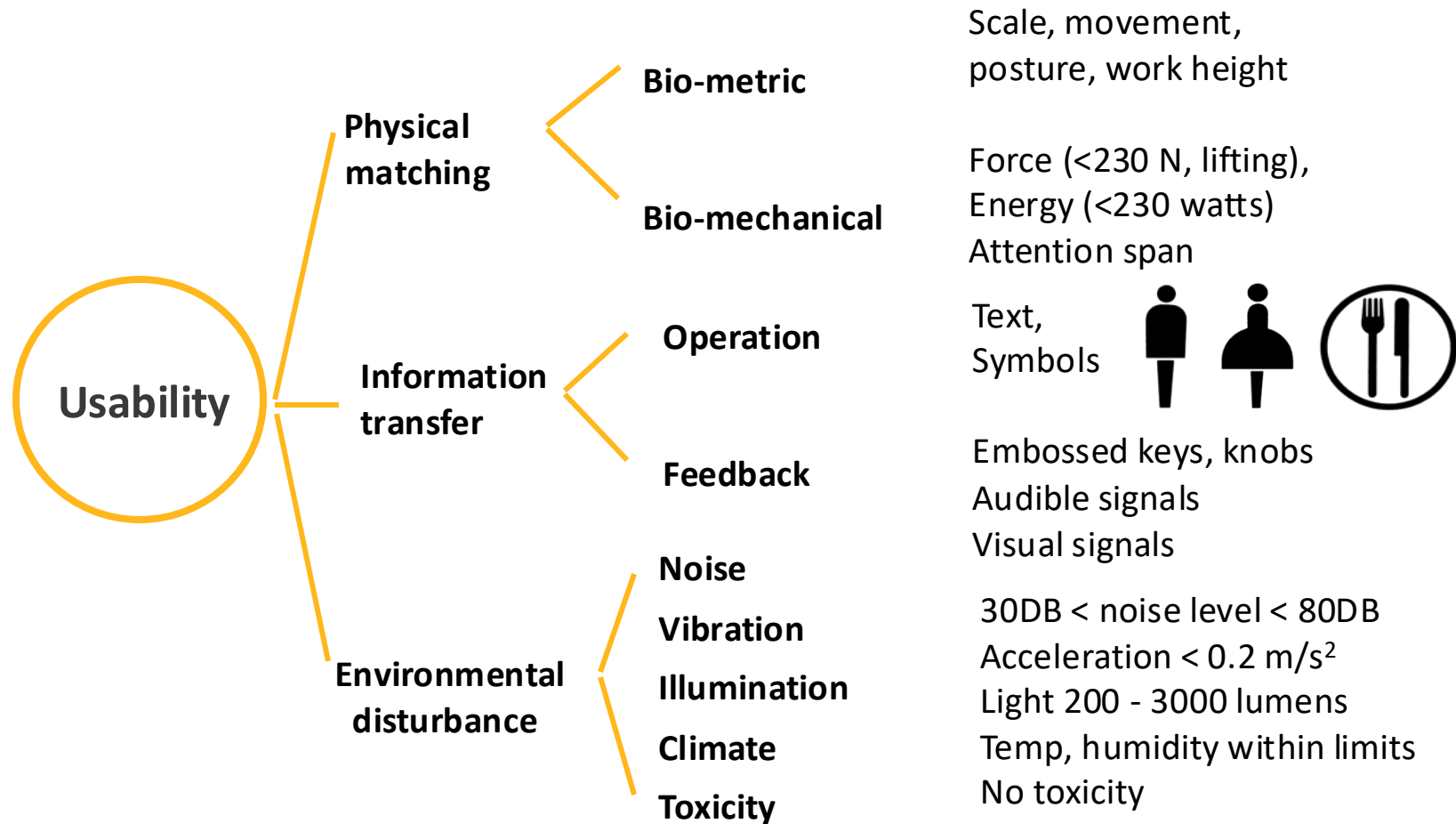


Three aspects

- Interaction with the **human body** - biometrics
- Interaction with the **mind** - intelligibility
- Interaction with the human **environment**

} Current topics

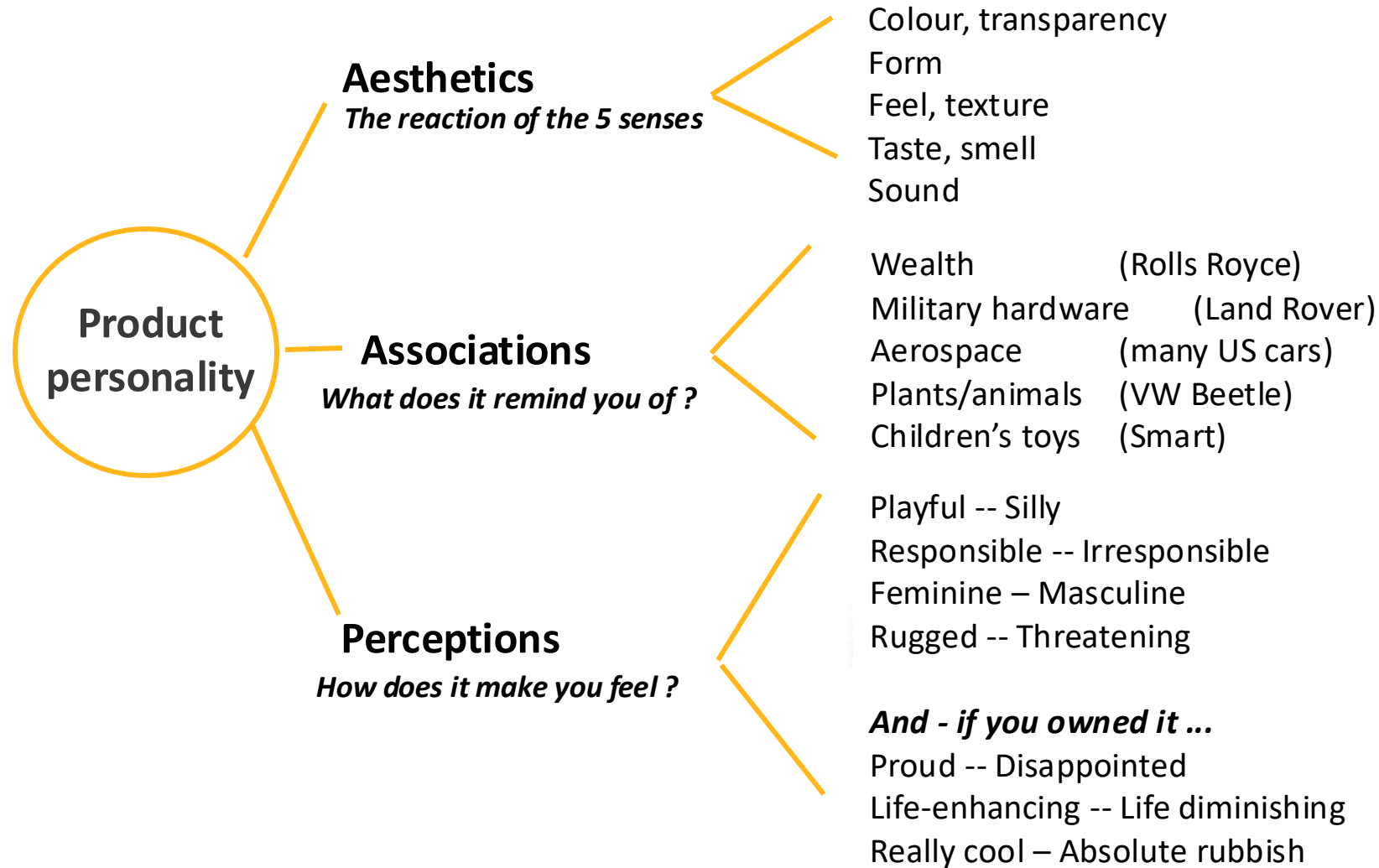
Usability (“ergonomics”)



Examples of bio-mechanical matching



Product personality



Material personalities

NO intrinsic personality?

- materials acquire one through the way they are used?

Wood in fine furniture – *craftsmanship*
in railway sleepers – *cheap utility*

Gold in jewelry – *luxury, wealth*
in micro-circuits – *technical efficiency*

Glass in a camera lens – *precision engineering*
in beer bottle – *disposable packaging*

Made of polished
walnut ?

Or made of
polystyrene foam
– recycled yoghurt
pots ?



Material moods

Wood, leather

Aesthetics: tactile, warm, textured, it ages well
Associations of fine furniture, musical instruments
Perceptions of craftsmanship, tradition, heritage, quality

Metals

Aesthetics: cold, clean, hard, stiff, strong, often ages well
Associations of machinery, precision instruments, weapons
Perceptions of strength, precision, durability, quality

Ceramics and glass

Aesthetics: hard, abrasion resistant, permanence of color, fragility
Associations of culture, luxury, sophistication
Perceptions of refinement, quality

Polymers

“Cheap plastic imitation”
Aesthetics: colorful, warm, soft, smooth, flexible, do not age gracefully
Associations of mass production, substitutes for metals, glass, wood
Perceptions: deceptive, cheap, imitationbut adaptable.

Five products: redesign them for a new market

The KOODI CODE, U. of Arts and Design, Helsinki



Hairdryer



Iron



Shaver



Toaster



Mixer

Redesign 1: Cuddlesome



TURBO-PUFF dryer



HISS iron



LOLLIPOP shaver



PIGGY toaster



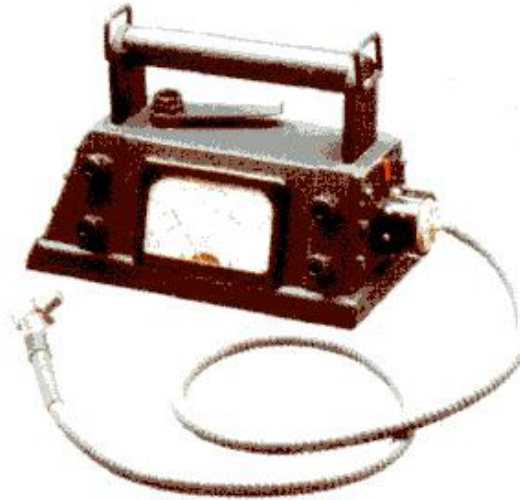
JELLIMIX mixer

The KOODI CODE, U. of Arts and Design, Helsinki

Redesign 2: Ruggedized



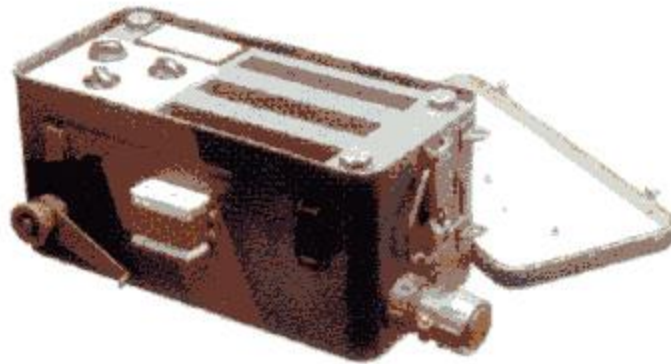
M/95 heavy duty hairdryer



BOLT ACTION iron



STEALTH shaver



JUNKERS FRONT LINE toaster



KALASHNIKOV mixer

The KOODI CODE, U. of Arts and Design, Helsinki

Creating associations and perceptions

Context
The office
Continuous
use.....

Materials
Pressed
steel
Powder
coated



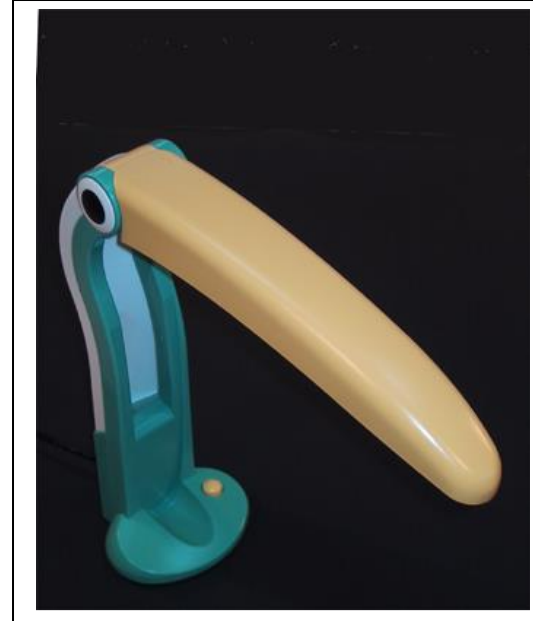
Desk lamp.

Aesthetics: colour cream, angular metallic shape, smooth texture, heavy.

Associations: Colour and form like that of computer consoles and keyboards.

Perceptions: Subdued, modern, efficient; rugged, fit for purpose

but also: dull, impersonal, suggesting the work-place



Lamp, same spec.

Aesthetics: Pastel colours, smooth curves, translucent, light

Associations: Form derived from nature, cartoons, comic strips.

Perceptions: Funny, playful, cheerful, clever.

but also: eccentric, frivolous, a bit silly

Context
Children
Bedroom
Intermittent
use

Materials
injection
molded
acrylic

Materials create associations and perceptions

Bang & Olufsen

Context

*Contemporary
drawing-room,
Board room*

Materials:

*Brushed
aluminum,
Black enamel*



Aesthetics: use of primitives; brushed metal, black/matt finishes

Associations: Organ pipes, the Arts, Music and Culture

Perceptions: High tech, advanced, sophisticated. Symbol of discerning taste. “Only the best is good enough”.

but also: Design with a capital *D*; overstated

Roberts



Context

*Older
people,
bedrooms*

Materials:

*Wood,
leather,
suede*

Aesthetics: soft shape and material, muted colour.

Associations: Handcrafted furniture and fittings, unashamedly retro.

Perceptions: Old style craftsmanship, durable reassuring, non-technical design

but also: mumsy – like a hand-bag

Case study: cheap compressor



What aesthetics?
What associations?
What perceptions?
What is the designer saying?



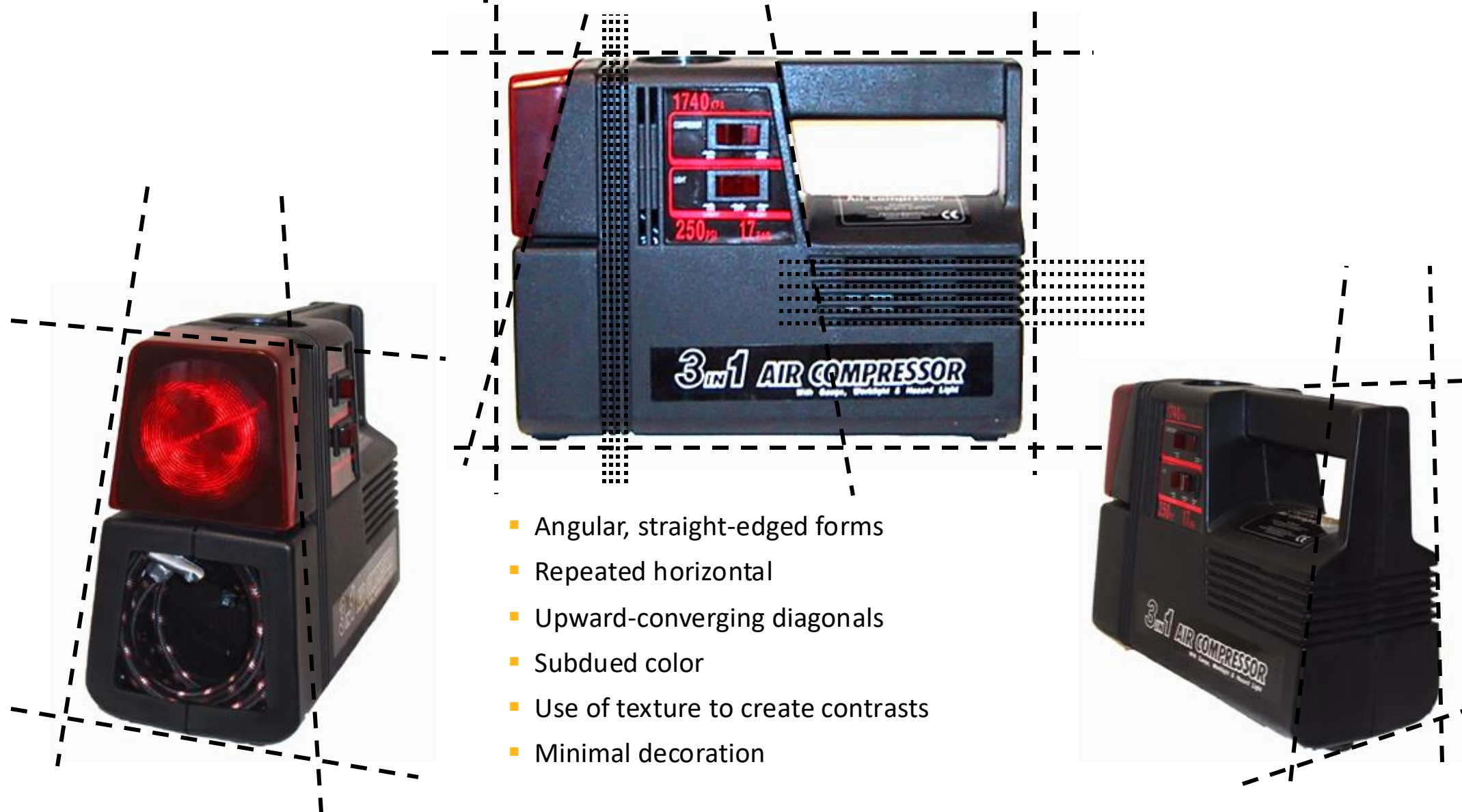
Robust “industrial strength” mood



- Angular, straight-edged forms
- Repeated horizontal
- Upward-converging diagonals
- Subdued color
- Use of texture to create contrasts
- Minimal decoration



The low-cost air compressor



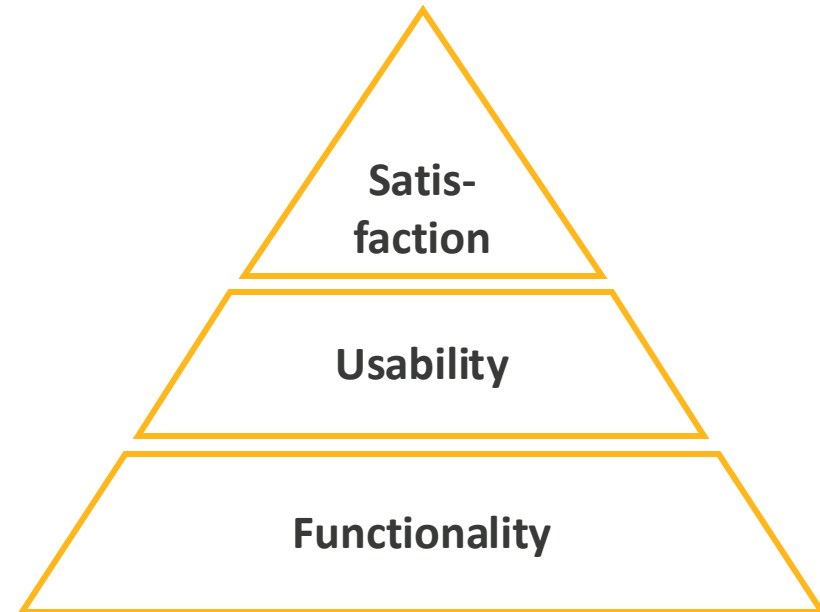
- Angular, straight-edged forms
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Summary

- (1) See product as a whole

- (2) Think of it in more than one way
 - What does the product do?
 - Who will use it? Where? When? Why?
 - What are their aspirations, self-image...?

- (3) The element of satisfaction is central to contemporary product design



Summary

Train yourself - look at products and ask:

- What **aesthetics**? Why?
- What **associations**? How did the designer do it? Why?
- What **perceptions**? What made you feel that way?
How (intentionally or unintentionally) did the designer do it?
- And finally: **what was the designer trying to say?**

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