Materials & Products Design/ 10661440

E-Learning Lecture # 1

Outline

This lecture will cover the following slides of Chapter 3:

Slide 2: Observation & Perception

Slide 3: Attributes of products, relating to industrial design and personality of a product

Slide 4: Verbal-Mathematical and Visual Thinking

Ways of Thinking

Technical design relies on deductive reasoning – thinking based on logic and analysis. Deductive reasoning, applied to the selection of materials, is described more fully in Chapter 7. It lends itself to formulation as a set of steps, often involving mathematical analysis. Industrial design, by contrast, relies on inductive reasoning – synthesis, drawing on previous experience. Inductive methods for selecting materials, also explored in Chapter 7, use perception and visualization. These we need to explore more fully since they are central to the discussion that follows.

In logic, we often refer to the two broad **methods** of reasoning as the **deductive** and **inductive** approaches. **Deductive** reasoning works from the more general to the more specific. ... **Inductive** reasoning works the other way, moving from specific observations to broader generalizations and theories

Observation and Perception

Imagine yourself to be standing in a motorcycle tradeshow behind two men who are looking at a Harley Davidson. The Harley has technical attributes, listed in its specification: weight, number of cylinders, power, maximum speed, the material of which the frame is made – these and many other attributes can be precisely defined and accurately measured. The Harley also has aesthetic attributes – it is black, metallic and loud. The two men see the same motorcycle but they perceive it in different ways. In the mind of one is an ideal image of a smooth, yellow, urban scooter, without visible mechanical parts, clean lines and trendy styling; he perceives the Harley as heavy, extravagant and dangerous. The ideal in the mind of the other is an image of an open road, a black leather bodysuit, a helmet with darkened visor, twin-exhausts; he perceives the Harley as powerful, authoritative, an expression of freedom.

Perception is the result of interpreting what is observed. Two observers of the same product will perceive it in different ways, ways that derive from their reaction to the physical object they see and the accumulated mental images and experiences they carry with them. Both observation and perception contribute to creativity in design, and here it is necessary that we sharpen the definition of four terms we will use to describe, in increasing order of abstraction, the attributes of products - particularly those relating to industrial design and the personality of a product.

· ***Aesthetic attributes*** are those that relate directly to the senses: sight, touch, taste, smell, hearing; those of sight include the form, color and texture of a material or product.

· ***Attributes of association*** are those that make a connection to a time, place, event or person – thus a jeep has military associations, gold has associations of wealth, the color black, in some cultures but not all, of death.

· ***Perceived attributes*** describe a reaction to a material or product – that it is sophisticated, or modern, or humorous, for instance.

· ***Emotional attributes*** describe how a material or product makes you feel – happy, sad, threatened perhaps – "emotional ergonomics," in the words of Richard Seymour of Seymour Powell, London.

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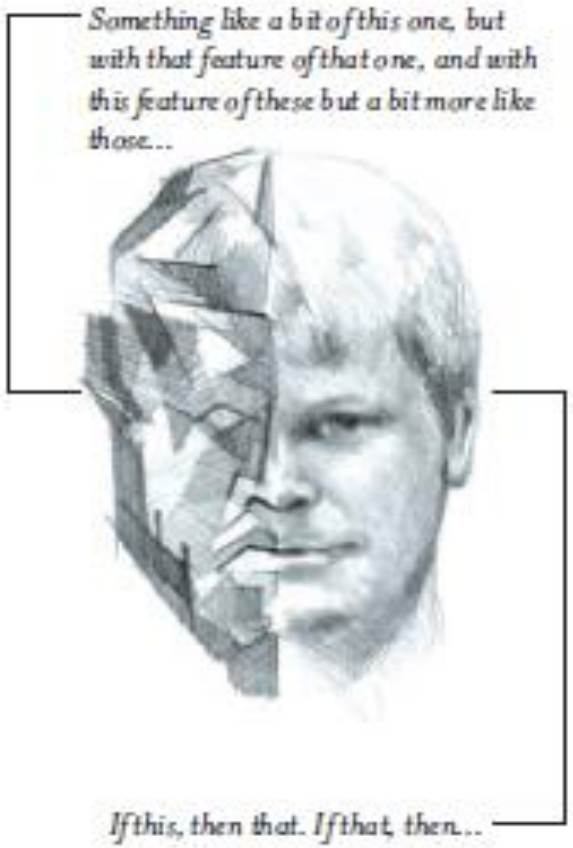

3.2 Left Brain, Right Brain
Thinking from the left or right – the first seeking solutions by logic and analysis, the second seeking solutions by synthesizing elements from recalled or imagined images or analogies.

3.1 Virtual Violin?
The form of the violin is an essential part of its personality. In this electronic violin, the ghost-like form both makes the connection to the original and suggests the transmutation that has taken place. (Courtesy Yamaha Corp.)

To these we add the word *style.* Styles have names: Art Nouveau, Art Deco, Modernist, Post-Modern, etc. Each is shorthand, so to speak, for a particular grouping of aesthetic, perceived and emotional attributes and associations – one about which there is general agreement. Styles, sometimes, are linked to certain materials, but it cannot be said that a material has a style, only that it acquires one when it becomes part of a product. Examples developed later in this and the next chapter will make these distinctions clearer.

Verbal-Mathematical and Visual Thinking

Writers such as McKim, discussing ways in which the human brain manipulates information in order to reason, distinguish two rather different processes (3.2). **The first, the domain of the left-hemisphere of the brain, utilizes verbal reasoning and mathematical procedures. It moves from the known to the unknown by analysis – an essentially linear, sequential path. The second, the domain of the right-hemisphere, utilizes images – both remembered and imagined. It creates the unknown from the known by synthesis – by dissecting, recombining, permuting, and morphing ideas and images.** The first way of thinking, the verbal-mathematical, is based on learned rules of grammar and logic. The second way of thinking, the visual, makes greater use of the imagination; it is less structured but allows greater conceptual jumps through free association.

Think for a moment about the following example of the way you store visual information. You probably know and recognize several hundred people, perhaps many more. Could you, if asked to draw a recognizable picture of any one of them, do so? Most people can't; many can't even conjure up a picture of the face in their "mind's eye" (their imagination). This suggests that the visual image is stored only in a very crude way. Yet if you unexpectedly encountered a person that you know in – say – Los Angeles International Airport, you would instantly distinguish them from the thousands of other people there. Recognition of a face or a place requires a detailed comparison of a visual image with an image stored in the mind, seeking a match of a very subtle kind – and the average person can store enough information to recognize and distinguish not one, but hundreds of these. The way the mind stores images is not well understood but it is clear that its image database is very large and, when triggered, capable of very rapid access and great precision.

Creativity in design (both technical and industrial) involves the free association and combination of images to achieve a desired set of attributes. The images may be visual – observed objects, photographs, sketches and drawings – or mental – stored in the memory and imagination of the designer.