Towards a product language
- Theories and methodology regarding aesthetic analysis of design products.

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Abstract

The article is an attempt to enlighten the subject of product language and how it may be applied to a design process.

In the first section, the author first gives a historical account of aesthetic philosophies in the last century, and then reviews different definitions and theories about product language, from sign theory, to semiotics, to the question of product identity.

In the second section, she presents a two-phased methodology for distilling a product's language, and developing new products with a specific identity. The product language is defined using a method for aesthetic analysis, while the new product is created using the results of this analysis as a framework.

Key words

Product language, product identity, semiotics, aesthetic analysis.

Introduction

The aesthetical aspect of our belongings and surroundings has always been of great importance to us. From primitive tools, to sophisticated electronic devices, there have always been some products that attract us more than others, that expresses something we long for, or that we feel familiar to. But how do products "speak" to us? What gives a product its character, or identity? Is it its colour, its shape, or is it a matter of how we subjectively interpret it?

The purpose of this article is to try to define what is meant by "product language", and to establish how to use that language in a design process.

The first part of the article called "Establishing a design language" contains three sections. It starts with a short historical overview over the different aesthetic approaches to industrial design, from the beginning of the 20th century up to today. It then describes the different definitions and theories about product language. The last section is a short discussion of the presented theories.

The second part focuses on methodologies for defining a product's language or identity, and how to develop new products with a specific predefined identity.

Establishing a design language

Historical overview

In her article "Beautiful and meaningful things" (2000), Josienna Gotzsch describes the different philosophies in product design dating from around 1920 to the present date. Over the last century, designers have gradually redefined the design discipline from aesthetics based on functionality, to decorative aesthetics, towards meaningful aesthetics.

In 1896, the American architect Louis Sullivan stated the legendary mantra "form follows function", referring to the influence of a building's function on its shape. According to the functionalistic design philosophy, "good" aesthetics were based on a maximum of organisation of the product shape. Decorative elements were avoided, since they did not directly contribute to the product's functionality. This philosophy, however, was proven to have limits (Bürdek, 1996). It leads to a minimalistic style, with a very low degree of self-explanation, or nonverbal expression by which the product exhibits its practical function (Gros, 1984). It thus becomes harder for the user to understand the product and its functions, and makes it more difficult to use.

In the 1930s the French product designer Raymond
Loewy said “la laideur se vend mal”, or that ugly things are hard to sell. He expressed the need for aesthetics in product design and used this expression to promote his services. He wanted to style (or decorate) products to make them attractive, and succeeded with his streamlined design, which later became a symbol of science and technology (Gotzsch, 2000). The division between aesthetics and semiotics (the product’s communicative aspect) in the product is not always exact. The streamlining was first used for purely aesthetical reasons, but later became a meaningful symbol, which signified modernism and technical progress in society.

Product designers started using the term “product semiotics” around 1985 (Gotzsch, 2000). The terms “semiology”, “semiotics” and “semantics” all derive from linguistics and deal with the study of signs. These terms will be explained more precisely in the section called “definitions of product language”. In the 1960s the French philosophers Roland Barthes and Jean Baudillard started to analyse the socio-psychological meaning of products. Barthes argued in “Mythologies” (1957) that objects and images not only signify their basic function, but also carry a “meta”-meaning, whereas Baudillard described the link between social life and symbols in products in “Le système des objets” (1969). On a product development level, Jochem Gros developed a “Theory on product language” for the students at the Offenbacher Hochschule für Gestaltung in the early seventies. The essence of this theory is the existence of an enlarged functionalistic view on product design, in which psychological aspects have a place.

In the early 1980s, the Italian Memphis group clearly broke away from the functionalistic constraints, creating products with greater emphasis on decoration and less importance on the product’s functionality. The practical, rational aspect of product design no longer fulfilled all needs. In addition to the practical aspects, there was a need for elements such as surprise, humour and poetry, or as Fayolle (Gotzsch, 2000) explains it: “We co-habite with our objects and their characters influence the harmonious ambience of our private territory”. It is however not always easy to apply these product language-codes as their functions are as complex as they are hard to identify and tame. Expressive products can create different reactions, user habits and trends change regularly, and finally, some product need to speak louder than others.

Fig. 1: Historical evolution of aesthetics from the beginning of the 19th century, to present date (Gotzsch, 2000)
The complexity of the product language shows the necessity of a thorough understanding of how product aesthetics interact with us, or how the products talk to us and how we “read” them.

Definitions of product language

Products as signs

“A phenomenon of material reality has become a phenomenon of ideological reality: a thing has changed into a sign” (Bogatyrev 1936). But what is a sign? "A sign, or representamen, is something which stands to somebody for something in some respect or capacity” (Charles S, Pierce). According to this definition, any product is to be considered a sign that carries a message about the product’s purpose, use, properties, functions, who made it, and so on (Monö, 1997). The sign denotes, or describes, and indicates something, such as the product’s purpose, but it also connotes, or implies, something, like the social status of the product owner.

So what constitutes such a product sign? There are two main theories, with a slightly different approach. In 1916, the Swiss linguist Ferdinand de Saussure wrote "Course in general linguistics", in which he laid the foundation of semiology, or the study of signs in society. According to de Saussure, the sign is a dyadic (or two-sided) entity that can be decomposed into a signifiant or signer and a signifié, or signified. In the case of a television set, the signifier would be the TV itself, whereas the signified would be “domestic appliance to watch moving pictures”. De Saussure’s dyadic theory is not optimally suited for the application to product language, as it emphasises the signified side of the sign and gives the signer -the physical product- less attention (Vihma, 1995).

Pierce, on the other hand, defines the sign as a triadic entity. He distinguishes the representamen (the signifier in de Saussure’s theory), the object (the signified) and the interpretant (the person who perceives and interprets the sign). This definition of the sign is more suited to our purpose. As the physical product can be seen as a sign vehicle, Pierce’s theory does not exclude a study of the physical product, which is crucial for the study of product language.

Product language, or product sign systems

According to Jochem Gros (1983), the theory of product language can be divided into two parts, the formal and the semiotic. Despite this acknowledgement of formal aesthetics, research in this field has not come very far, whereas design researchers have taken a large interest in the product language’s semiotic aspects.

So what are product semiotics? Although the definitions vary slightly, the term “sign” seems to be central. According to Italian writer and semiologist Umberto Eco, semiotics is the study of signs and sign systems, their properties and their role in socio-cultural behaviour. Applied to product design, semiotics states that we place meaning in what our senses (visual, olfactory, haptic, auditory, kinaesthetic, taste…) perceive (Monö, 1997).

As most sciences, semiotics is subject to different interpretation, and can be subdivided into different functions.

Semiotics as indication- and symbolic functions

As shown in figure 3, Jochem Gros distinguished the practical from the communicative aspects in products. He called the communicative aspect “product language”, which is constructed of semiotics and formal aesthetic functions. Furthermore, he divided semiotics, or meaningful product aspects, into indication functions and symbolic functions. Indication functions give information about the product, symbolic functions explain something about the product user or the socio-cultural context in which the product is to be used (Gotzsch, 2000). Based on Gros’ communicative theory, Josienna Gotzsch has identified three types of product message: the message can say something about the product itself, its user or about the company. A synthesis of Gros’ and Gotzsch’s theories is shown in figure 3.
Semiotic dimensions of a product

Aristotle distinguished four different bases for understanding something. A product can be explained by its materials, structure, efficient cause and purpose. These four explanatory aspects are close to the four semiotic dimensions Max Bense (1971) introduced for a design product (Vihma, 1995). According to Bense, the product can be divided into a material dimension, a syntactic dimension, a semantic dimension and a pragmatic dimension.

This subdivision is the most common approach to product semiotics, only the material dimension usually fuses into the remaining three, as it is often difficult to see a product’s materiality as an isolated quality. In other words, the main trend in product semiotics is to focus on syntax, semantics and pragmatics.

The syntactic dimension covers the product’s structure, technical functioning and the product’s relation to its surroundings. Etymologically, the word comes from Greek syntassein (syn together, tassein arrange). It is originally a linguistic term, which can also be applied in the sign system for useful products. In language, signs or words are put together in meaningful combinations, sentences. Depending on what we want to express, the words are arranges in different ways, altering their relationship to each other. If we draw a parallel to product language, one could say that product syntax describes how a product sign relates to other signs, such as other product signs within the product, but also signs in the product environment (Monò, 1997).

The term “semantics” also comes from the Greek word semantikos, which means to designate. According to the American semiologist Morris (1946), it is “that branch of semiotics which studies the significance of signs”, in this case, the significance of product signs. As determining the meaning of a product may be a difficult and somewhat subjective task, several theorists have made attempts to sort out different semantic functions. The first person to do so was Charles Pierce, who stated that a (product) sign may refer to an object in three different ways:

- as an icon, or sign that bears a likeness to what it represents, like a woman-figure on a door showing that the room is to be accessed by women only.
- an index, or sign causally related to what it designates, like a footprint showing the former presence of someone on a beach.
- or a symbol, or something that designates something else by convention, like the “male” or “female”-sign, or a heart to express love.

Another way to classify semantic subdivisions is by grouping them into the functions (Monò, 1997)

- to express properties or qualities
- to exhort reactions
- to identify a product, its origin, location, nature or category

Finally, the last semiotic dimension, pragmatics, comes from the Greek word pragma, activity, and deals with the use of products or product signs.

All these semiotic dimensions will be developed further with regard to a practical application in the method presented in the next part.

Conclusion

Product language is currently mostly synonymous with product semiotics. As in any other language, semiotics has different components or dimensions, as described earlier. Although these dimensions may differ, and the boundaries between them may seem somewhat blurred and diffuse, there seems to be little argument about a semiotic subdivision into three main categories:
semantics (the meaning of the product), syntax (the relationship between the product’s components or between the product and other products), and pragmatics (the use of the product). Another important common factor to these different theories is that the product has to be considered as a sign, and not only as a useful product, when dealing with product language.

**Discussion**

In spite of all the research done in the fields of product semiotics, it seems to me that there remain some gaps to be filled, before one could actually claim to have a product language for "reading" or analysing a product from an aesthetic perspective. I would agree with Jochem Gros' definition of product language, which stated that formal aesthetics play an important role in product language, and should therefore be looked into in parallel with the semiotic aspect. Yet these formal functions are set aside, and modern design theory shows no clear link between product form (perceived with all senses) and product semiotics, where the mutual dependency of the two should be obvious!

In my opinion, product semiotics derive from formal aesthetics, as the semiotics are a sort of interpretation of what we actually perceive through our senses, into the signification we assign to these sensorial perceptions. Thus the interpretation process starts with a sensorial analysis (a visual analysis, for instance) of the given product, leading to the abstract impressions and meanings induced by these sensations.

As product semiotics is a relatively new science, and research in the fields of product language is still in its childhood, there lies a great potential in combining product semiotics with formal aesthetic disciplines, such as topology and morphology, in order to establish a proper design language.

In an article entitled "Semiotics in design practice" (2000), Andries Van Onck, a professor in design theory at the Politecnico di Milano, expresses the insufficiency of semiotics as a product language. "We can postulate the existence of a product language, as a type of visual language, to the extent that we assume that designed products configure the formal expression of a solution to the original problem". But "at the most, in design language, the functional regions in products can be tentatively compared to "nouns" and their relations to "verbs" in written language." He then proposes to include other scientific disciplines, such as perceptive topology (gestalt theory) and morphology, in the search for a product language, as these disciplines can furnish the vocabulary and methodology for a classification of the formal objects as signs.

**Product language as an expression of product identity**

Our perception of a product is always linked to factors outside the product itself. We evaluate the product with regards to its references, such as its manufacturer, its social status, its cultural context etc. Thus the product can never be considered as an isolated "one way language", but as a dynamic expression of its identity. The product is speaking for its company, time, users and other references. Whereas product semiotics equals a sort of product linguistics, product language in my opinion must be enlarged to comprise the influence of both formal and strategic factors, which build the product identity. In addition to proper semiotics, product language must be seen in the light of formal aesthetics. To ignore or overlook the close link between the product’s gestalt, its formal elements, their relation and the semiotic values we may derive from them seems to me like going straight to analysing a poem's metaphors without considering its theme or mood.

Based upon these arguments, I choose in the following to define the term "product language" as a direct reflection, or expression of the "product identity".

**Methodologies for understanding product language and bring it into new products.**

The following sections will present a methodology that may be useful in a design process where product identity and expression is in focus. This is often the case when a designer is asked to create a product within a specific product range, or according to certain trends or company image.

The methodology consists of two phases. The first one, which is an aesthetic analysis, aims at bringing out the aesthetic essence, or identity of a specific product or product range. This step goes from a physical, concrete product, a perceptual object, and ends up with an abstract product vocabulary that defines the essence, or identity of the product.

The second phase is to bring this abstract identity into a new product, in other words to create a product that speaks the same language as the analysed one. Figure 5 illustrates the flow in the methodology, going from a product with identity X, to a definition of this identity (called "totem"), to a new product with the same identity.
Fig. 5: Schematic representation of the two presented methods (aesthetic analysis and “totem”- method for development of new products)

Phase 1: Towards an aesthetic analysis.

The presented method is meant to be a tool for conducting an aesthetic analysis of design products, and aims at defining a product identity, or aesthetic essence.

It is based upon Aubry and Vavik’s (1992) method for functional product analysis, Rune Monö’s three-dimensional semiotic approach, Susann Vihma’s method for semantic analysis, and Angela Dumas’ “totem building” method (Dumas, 1994).

Aubry and Vavik’s method focuses on the functional aspect of products, but from an aesthetic point of view. They propose an analysis based on the product’s referential, technical, semantic and practical function. Monö presents the different components of the three semiotic dimensions syntax, semantics and pragmatics, whereas Vihma’s book “Products as representations”, presents a method for semantic analysis, based on Pierce’s triadic sign theory. Finally, Angela Dumas’s contribution is a totem-building method, or how to develop sophisticated metaphors that help to define the product’s identity and serve as criteria to develop and evaluate alternative product solutions.

In addition to these merely semiotic methods, I have found it necessary to add a focus on the product’s formal aesthetic properties. Thus the method below includes elements of formal aesthetic theory, which derive from Cheryl Akner-Koler’s “Three-dimensional visual analysis” (1994). According to the semiotic methods, the formal aspect seems to have been left aside, or has simply fused into the other semiotic dimensions, which is understandable, as there are no clear boundaries between what we (think we) perceive, how we perceive it, and the meaning we assign to it. Nevertheless, I think it is important from a pedagogic point of view to try to sort out all these entangled formal and semiotic elements, in order to clearly define and distinguish

- **what** we actually perceive: what we see (form), touch (structure, temperature, material, surface), smell (wood, rubber), hear (sound of massiveness as opposed to that of hollowness)
- **how** we perceive it
- **and what** the product tells us (the interpretation of this perception).

Step one: establish a referential framework for the product:

- What is it?
- What is the purpose of the product?
- What is the product-context? Important issues here are questions regarding the product’s historical background and the implications it might have, find the current trends (in time & techniques), descriptions of the company’s profile or business situation (is the product a new launch? A renewal of the company’s image?). It’s also important to identify the product’s physical environment (office, home…) and cultural context.

Step two: analyse the product’s formal aesthetics and syntax.

This step is a very descriptive one, which aims at:

- Distilling the product’s formal elements and their properties: basic forms (volume, planes, lines, point, positive / negative elements), dimensions (height, width, depth), proportions (inherent and general)
- Discovering the element’s movements and forces: axis, axial movements, forces (strength, scope, angle, directional forces), curves
- …their relationships: order (dominant, subordinant, subordinate), axial relationships, comparative relationships, joined forms, transitional forms (divide, adapt, merge, distort), forces in relationships, evolution of form
- …and organisation: 3D spatial matrix (vertical, horizontal, depth), organisational framework (static, dynamic, organic), symmetry and asymmetry, balance (structural and visual), orientation (direction, position, tip/rotation), overall proportion.
- Defining the product structure and technical construction.
- Finding the relationship between the product sign and
  - the current product sign, or “ideal type” (the market’s conception of the way in which a product’s principal function is traditionally presented in its gestalt).
  - the style sign
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- The product range sign
- The sign of the product family
- The plagiarised, or copied, sign
- The paraphrase (“a product that reports something essential in common with some other unique product sign and at the same time appears as an independent work” (Monö, 1997)).

Step three: analyse the use of materials and colours.

Materials and colours can emphasise certain aesthetic (formal and semiotic) qualities in the product. The factors affecting our perception of colours and materials in a product are:

- Psychometrics, or how we mentally react to different colours.
- The relationship between form and colours/materials.

Colours can be seen as a secondary product language, and within this language, we tend to order the chromatic impressions according to isochromy (same colour), isophany (same brightness) and isosaturation (same degree of colour saturation).

- The functional aspect of colours and materials.
- The perceptual features of the product have been analysed, the next milestone is to analyse the product's semantic dimension.

Step four: analyse the product's semantic dimension.

Once the perceptual features of the product have been analysed, the next milestone is to analyse the product's meaning.

The product's different sorts of signs work in four different ways (Monö 1997): they can either
- describe the product’s purpose, mode of operation, and the likes
  - express the product’s properties.
  - exhort reactions.
  - or identify a product, its origin, location, category or nature.

Once a function has been assigned to these different signs, the next step is to identify the nature of these signs. According to the piercian tradition, represented by Susann Vihma’s method for semantic product analysis (Vihma, 1995), the product sign’s message or messages is conveyed through:

- iconic signs, such as the tradition of form, similar colour or/and material, metaphors, style or similar environment.
- indexes, like the trace of a tool, a pointing form (direction and dynamics), marks of use, other traces that would indicate the product’s material quality and external circumstances, light and sound signals, sound of use and noise, smell, touch of the material, or graphic figures on the product form.
- and symbolic signs, such as graphic symbols, symbolic colour, forms, positions and postures, or symbolic material.

(Observe that many of these signs have been marked out during the formal aesthetic analysis, but without being “translated” or given a proper semantic function).

Once the meaning of the signs has been established, a closer look at how these signs are used would provide a better understanding of the sign’s communicative and sociological function, and give a profile of the product sign’s potential users. One would probably discover that there is a close dependency and dynamic relation between the semantic, pragmatic and syntactic dimensions. While conducting an aesthetic analysis following a method like the one suggested in this article, one would often find oneself adjusting and tuning the semantic and pragmatic analyses to each other, as new information is revealed.

Step five: reveal the product’s pragmatic dimension.

Until now, we have merely analysed the product regardless of its use. This, however, is a crucial aspect, as most products are so called “useful products” (Monö, 1997), and will always relate to a user and context of use. The fifth step of this method is therefore to analyse the product sign from the point of view of its use over the product’s entire life cycle. Issues to discuss in this context would be:

- Who uses the product sign?
- Who wants to use the product sign as a message, and to say what?
- Which roles does the product play at different levels of use, and how does this form the message?
- What signs are used and in what context?
- How does the context affect the use of a certain sign?
- Is there one specific sign that is just as suitable in context A as in context B?
- How is the product sign used? Are form and colours used in accordance with a specific target group or current product sign?
Step six: building the product vocabulary
At the end of step five, the “technical” part of the analysis is over. The last step consists in building a product vocabulary that sums up the analysis. This final step is meant to lead to a verbal and visual summary of the product’s key semiotic and physical qualities. The summary can include images as well as words, the important thing being that it conveys the essence of the product’s aesthetic qualities in a precise and unambiguous manner. The purpose of this “caricature” may be to form a platform for further design development of the product itself, or it can work as a kind of checklist to see if the product actually embodies the desired expression. It may also represent a framework for the design of new products sharing the same qualities as the analysed item, as I will explain in the next section.

Phase two: Using the aesthetic analysis as a framework for the design and development of new products.

In the course of their work, designers and product developers will often face the task of creating a product within a specific product range, or family. Such a task requires a thorough understanding of the product range’s aesthetic identity. According to my extended definition of product language, namely as something beyond product semiotics, including references to the company, the product identity is expressed through the product language. An analysis of the latter will accordingly lead to a definition of the product range’s key qualities that are to be reproduced in the new product in order to make it part of the range in question.

The method presented below illustrates how to take the step from a conceptual or abstract product (range) identity or “totem” (Dumas 1994), to a physical product that “speaks the same language”.

Step one: build a totem.
As soon as a product vocabulary has been established (see previous section), the first step towards a “materialisation” of it is to build a product “totem”, or to develop a set of metaphors that will function as guidelines and serve as criteria to evaluate alternative solutions. The totem is a refined version of the...
perception of the product, as it emerged from the analysis. The totem can take the shape of words, pictures, 3-D models illustrating the totem, or drawings, and function like a sort of three-dimensional mood board.

**Step two: generate new product ideas and concepts in accordance with the totem.**

Once one has achieved an abstract caricature or description of the product- or product line’s dominant qualities, it’s time to bring these down to real product concepts.

**Step three: evaluate the concepts and select the one that is the closest reflection of the totem.**

This final step uses the totem as main criteria when evaluating the different product ideas, the crucial question being "how well does the product reflect the totem?".

**Conclusion**

A thematic or totem-oriented method seems a well suited guideline when it comes to developing new products within a specific product range with a certain product identity, using a certain product language. Having to really define the aesthetic essence of the product before actually conceiving it, forces the designer to be more aware of the aesthetic impact and consequences of each added element, adjusted curve, or removed pattern during the creative process, but it also helps her or him to select and reject ideas at an early stage, as the designer finds her- or himself in a sort of “product mood”.

**General conclusion**

Judging both from the theoretical material and from my own experience, the existence of a product language seems irrefutable. Nevertheless, the subject remains difficult to grasp, as there is no complete theory that embraces all its different aspects and complexity. Some may argue that defining product language once and for all is an impossible task. If we “read” the products as our interpretation of a sensorial perception, the language we interpret is highly subjective, and actually our own. Yet we search for a way to generalise and systemise the way we perceive and define things, in order to reach a common basis for communication and understanding. I believe this is where a concise and thorough methodology for analysing and interpreting products plays a decisive role, as it leads us step by step towards a common understanding of a product’s expression and identity. This should motivate more product semiologists and design researchers to enlarge their view on product language, and see the need to include other disciplines. As multidisciplinarity seems to be a trend, I think we’re gradually approaching theories and applications related to product language that are more complete, and better suited to practical design purposes.
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