

Semantic mapping of the design process - an initial frame



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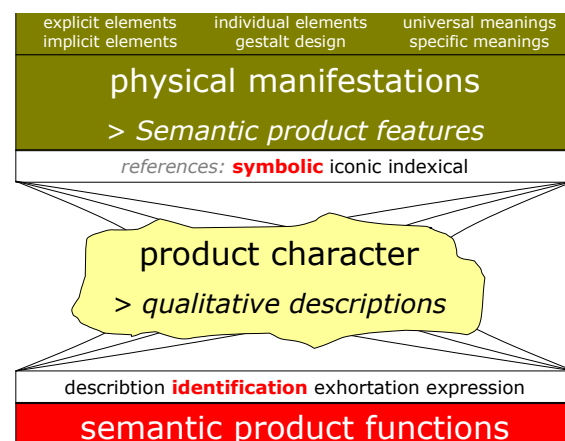
Background

This paper proposes an initial frame for the analysis of semantic contents of product design, evolving throughout the design process. The frame will be further developed within the SeFun project and tested through various company cases. The pilot study is scheduled to June-December 2004.

The frame is based on my doctoral research (to be published at the end of 2004) that has explored the issue of semantic transformation as a framework of communicating strategic brand identity through semantic references in product design. The study had two main objectives. First, the construction, nature, and implications of semantic design references were explored and described in the context of strategic brand communication. Second, a theoretical approach connecting perspectives of brand research and product semantics was constructed. The conceptual framework of semantic transformation comprises four main aspects: 1) basis of strategic brand identity, 2) visual communication and product portfolio management, 3) design as brand expression, and 4) semantic transformation in design process. The study presented a semantic approach into analysis of product design and identified the central conceptual dimensions in this regard: the partiality of product characteristics, genuineness of design references, traceability of design elements, product categorisation, and reference levels.

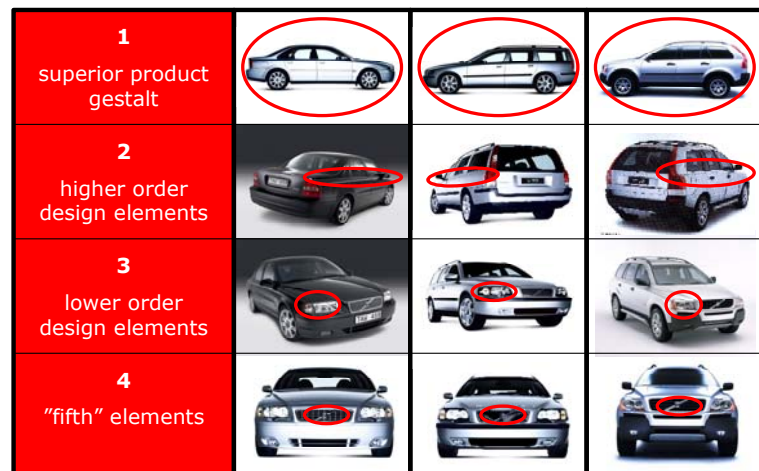
These dimensions will be further explored in the SeFun project. On the generic level, there appear three main levels for the analysis of semantic aspects in product design: product functions, qualitative descriptions, and physical manifestations (see figure 1). First, it is important to identify what are the semantic (communicative) functions the product, its individual features and characteristics, are designed to perform. Second, qualitative descriptions that may be referred to as the "product character" are the core of the analysis. They are the central level of human conceptualisation. Only after identification of the product character it is possible to contemplate its physical manifestations.

Figure 1



Regarding the physical manifestations of the character, the product design elements, the main interest is directed to universal and specific meanings products evoke. This is actualised through explicit or implicit design elements that appear on various levels. In figure two, an example of four levels of analysis is given, based on the work of Anders Warell. The exact number of appropriate levels for analysis depends on the case. In addition, the communicative significance of various elements can differ between different products, and even between different concepts produced during the same design process. Moreover, this frame only regards elements that are traceable, thus explicitly recognisable and definable. The eventual perception of the product also implies implicit aspects that are, by definition, indefinable for the most part.

Figure 2

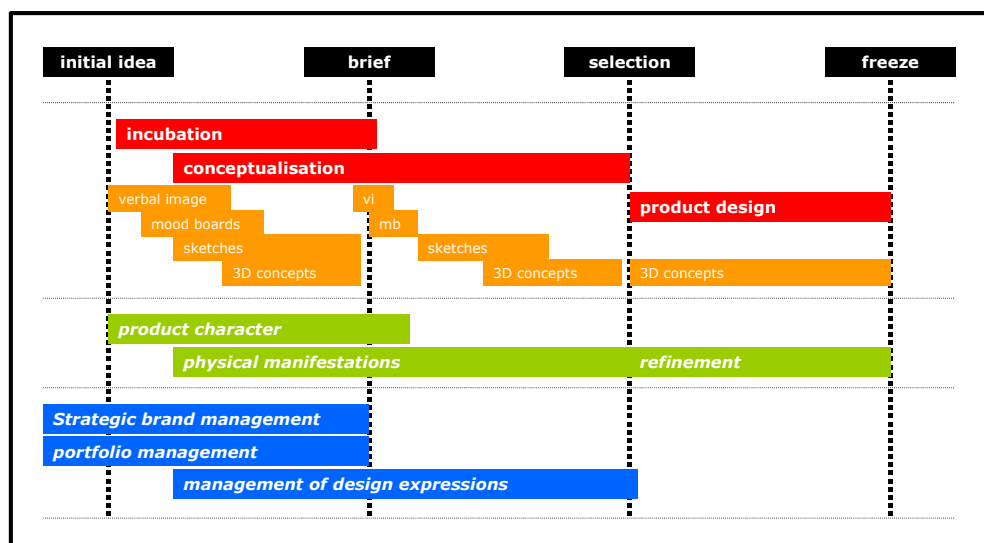


Description of the design process

The act of encoding intentional meanings into product design elements, semantic transformation, takes place within the design process. To study how the semantic contents of the product design evolves throughout the different phases of the process is an issue of great interest.

A general description of the design process was constructed in my doctoral research on the basis of Nokia and Volvo cases (figure 3). The illustration of the process, as presented here, is an overly simplified conceptualisation. The execution of the process can vary significantly between each specific product case, not to mention the industry differences. The frame aims to identify the main phases of embodiment design that are regarded important in terms of the semantic analysis. The exact number and lengths of the phases and their contents can be defined only in connection to specific studies.

Figure 3

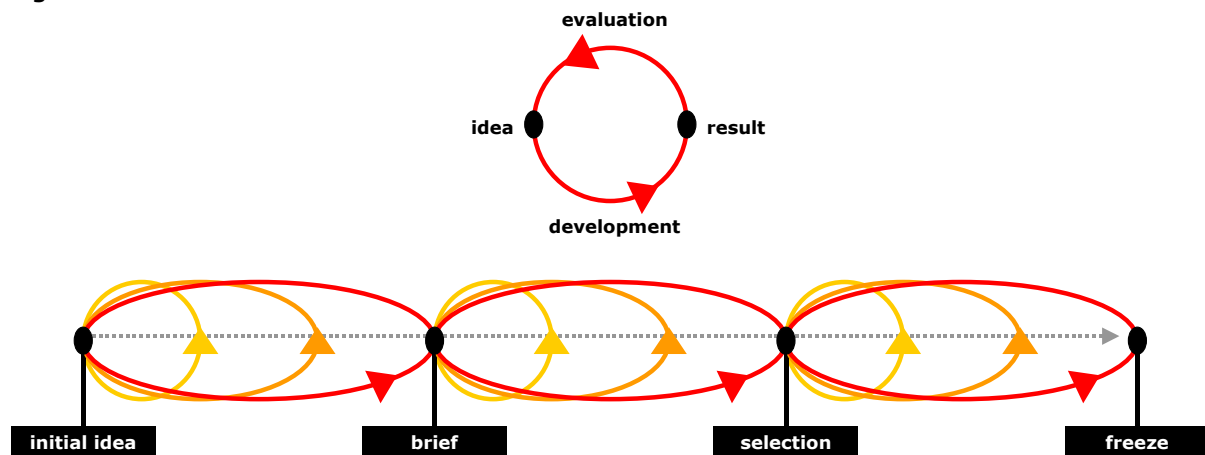


The phase of conceptualisation is naturally the main phase under scrutiny. Much of the conceptualisation occurs already before the start of the official product development process. Between the initial idea and the actual design brief, there often exists a pre-phase that is sometimes called "incubation period" during which the initial ideas of the product character and its first manifestations take place. The creation of the basic product character, thus, focuses on the early phases of the design process. Before visual manifestations of the product, the major aspects of product character are usually created first in the form of verbal images (qualitative characterisations) and mood boards.

During the conceptualisation, sketching and other conceptualisation methods are used in order to manifest and further develop the product character. The first concepts are of great importance, while they function as embodiments of uncontrollable imagination, including physical replicas of identity with sign references that might be difficult to explicate otherwise. First, the product takes form on a rather general level. As the process proceeds, the number of significant design elements and analytic levels, referred to in figure two, increase. After conceptualisation, when the selection of the leading concept is made, the product design phase merely concerns refinement and working with the details of the product. Although the basic form of the product is already decided, the product design phase is important in order to achieve a sufficient level of design quality in the product. The phase produces various stage concepts and terminates when the point of design freeze is achieved.

The creative process of design process is not this straightforward. Alternatively, the process may be thematically illustrated as a process constructed of successive iteration loops (figure 4). The basic circle (that is fundamentally a hermeneutical one) involves development and evaluation processes between the idea and its manifestation. The process is actually restarted at the main stages of the design process. However, the idea that starts the new iteration circle is every time more developed and more precise. The number of possible alternatives is constantly reduced as the process proceeds.

Figure 4



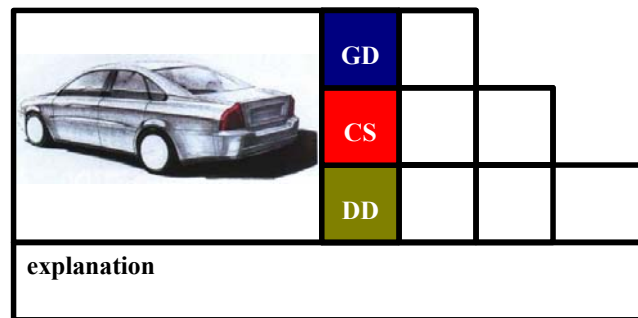
The process of semantic transformation involves both divergent steps, during which a number of alternative concepts are generated, and convergent steps, when concepts are evaluated and the most promising ones selected to further development. Conceptualisation is characteristically a divergent activity. On the early phases of the design process, it is usually important to create lots of variations of the product character. By doing this, it is less likely that the indications of a close-to-optimal alternative are found and mutually agreed within the design team. Once the selection of the concept for further development is made, the design work is largely of a convergent nature. Semantic references are developed in detail, but they may not have a radical influence on the overall product character.

Initial frame for analysis

The basic purpose of the semantic mapping is to collect and analysis all the concept images (mood boards, sketches, 3D concepts) that are developed during a specific design process. This work may be completed real-time during the process or after the process is finished. The visual analysis of material is supported by interviews with the persons involved in the process. In particular, it is important to clarify the intentions of those designers that have created the concepts. It is relevant to find out what was the starting point for conceptualisation (the initial product character and various requirements) and why specific solutions were created and further developed, and others not.

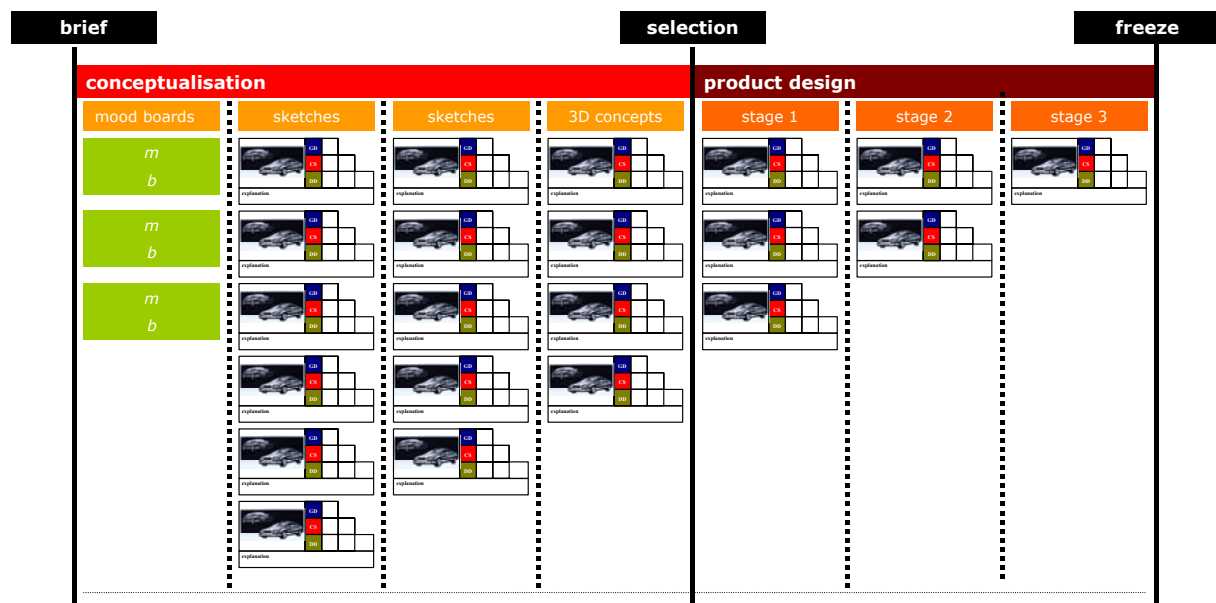
Figure five presents a simplified example of a “module” that comprises the analysis of one concept image. On the module, the significant design elements on various levels (GD = gestalt design, CS = characteristic shapes, DD = design details) are identified. The explanation part involves the designers’ descriptions of the elements, the researcher’s interpretations, external requirements, and other issues that have influenced the conceptualisation. Depending on the concept, the contents of the modules can differ greatly. Despite this semi-formalised approach, the fundamental base of the analysis lies on qualitative considerations. The analysis cannot be mechanistic also because of the practical issue that the conceptualisation material is rarely consistent, not even on a specific phase. Products are visualised from different angles, different details may be highlighted, some concepts are quick illustrations and others more profound works of art, and so forth.

Figure 5



The aim is to organise the modules in accordance to the process phase on which they were created. Figure six presents a simplified illustration of a simplified process. The purpose of this organisation is to group the conceptualisation material in a form that allows easier conclusions to be drawn from the data.

Figure 6



After organising the material, the mapping of the design process, various analyses may be conducted. The eventual form and contents of the analyses will be further clarified after the first case study. In effect, as the design processes tend to be highly case-specific, and the conceptualisation materials produced during the process differ in terms of contents, quantity, and quality, the data collection and analysis need to be reconsidered in each specific case. Nonetheless, some of the initial themes of analysis are described here.

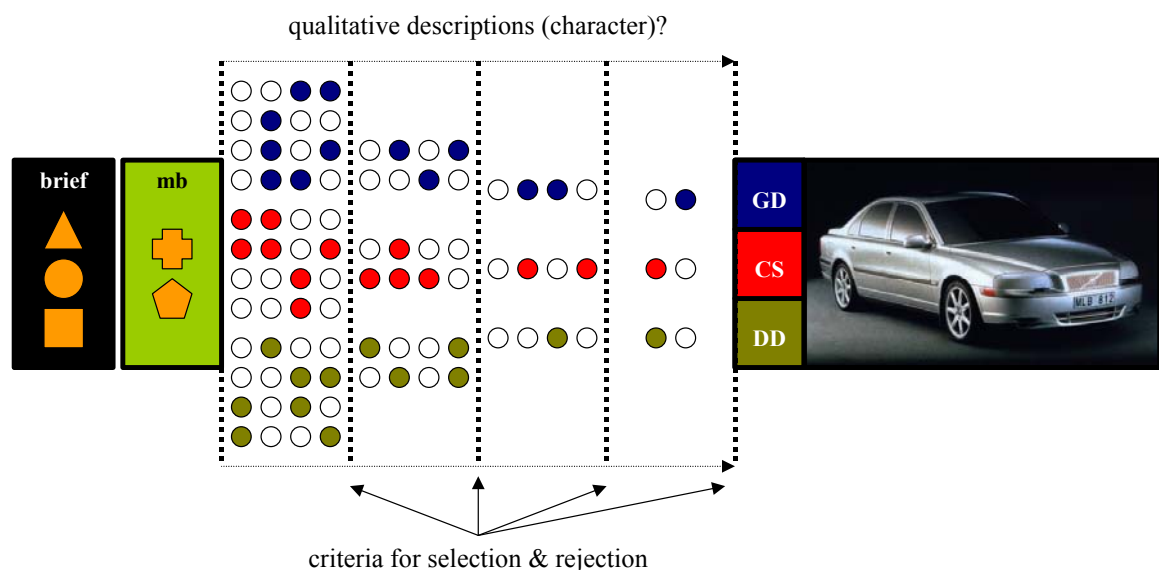
The main emphasis is put on the analysis of the design elements of different levels. This analysis may be started from the final (frozen) model and conducted backwards to the start of conceptualisation. Through this, it may be revealed, how the eventual design elements on various forms evolved during the process, at which points specific elements emerged, what elements were carried further to the subsequent phase, and which are

the ones that were rejected. This idea is visualised in figure seven. The coloured balls illustrate the concepts incorporating elements that led to the eventual design. Through such a mapping, various paths of design evolution may be described within the process.

As important as it is to visually analyse the evolution of the design element, it is not sufficient. The crucial part of the analysis involves descriptive explanations of the above aspects. It is important to clarify what was the basis for specific solutions, what external requirements emerged during the process, what were the personal intentions of the designers, what were the criteria for selecting or rejecting certain solutions. To gain such information, personal interviews with the designers are in a primary role.

Fundamentally, design process involves semantic transformation from qualitative descriptions to physical manifestations. Specific characteristics (illustrated with triangle, ball, and square in figure seven) for the product are defined in the design brief or in other form. More characteristics, and more detailed descriptions, may emerge during the process, in mood boarding or during the conceptualisation phase. It is interesting to clarify what initial characteristics have been treated prevalent during the process, and when and why have new ones emerged. Most importantly, it needs to be explored how these characteristics have influenced physical design elements.

Figure 7



The mapping also allows a wide perspective to more detailed semantic analyses of the product concepts. Partiality (universality) of characteristics, genuineness (directness) and nature (symbolic, iconic, indexical) of design references, and traceability of design elements may be pondered in an in-depth manner. Moreover, the significance of different design elements in terms of visual communication may be identified. On the basis of large data, gathered through a number of similar cases, generalisations may be constructed on the nature and contents of communicative aspects of product design.