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## **Product development with a focus on attractive product expression: an analysis of case studies**

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**Abstract:** Creating outstanding products is vital for a company's endurance in competitive markets. A mix of functionality, ergonomics, aesthetics, symbols and price aspects all play a role in making a product desirable.

Some products carry a personal meaning for its user. Others communicate its user's identity or the company's brand image. This study concentrates on communicative and meaningful aspects in a product's design. It examines how the creation of a communicative design occurs during the new product development process. The present research has an exploratory nature. For the field research, the case study method was chosen and a guideline for semi-directed interviews developed. This interview guideline was used to analyse

multiple product development projects in two distinct companies. In two projects, specific attention was given to communicative aspects in the product's design. These two projects are examined in this paper.

In the two selected projects, the product development teams carefully studied the users' preferences for aesthetics and product messages. A user-centred approach was used in both development processes. The choice to purposely improve the communicative value of the product's design was on the one hand influenced by the limited possibilities to create other advantages, such as improving the product's functionality or reducing its cost price. A weakness in the competitor's design strategy allowed the successful improvement of the product's communication on the other hand.

**Key words:** User-centred Product, Design Management Process, New Product Development Process, Development Product Expression, Product Meaning, Product Language, Product Value

**Biographical notes:**

**Josiena Gotzsch** is Associate Professor in the Department of Technology Management at the Grenoble Ecole de Management (GEM) and Program Director at the Grenoble Graduate School of Business (GGSB) for the international Undergraduate Program, France. Josiena Gotzsch obtained a Doctorate of Business Administration (DBA) at Henley Management College, UK and a Master of Science (MSc) in Industrial Design Engineering from the Delft University of Technology, the Netherlands. She teaches Industrial Design, the Product Development Process and Technology Management. Research interests include product design, product communication (aesthetics and symbolic value), product attachment, design management and product development.

**Professor J.J. Chanaron** is currently Research Director within the French National Centre for Scientific Research (CNRS) and Chief Scientific Advisor at the Grenoble Graduate School of Management.

Jean-Jacques has published extensively via books, articles in refereed journals and conference papers in Industrial Economics, Economics of Innovation and Technology Management since 1973 when he received his PhD at the University of Grenoble. He also holds a HDR in Economics since 1994. He is Associated Professor and Researcher with Henley Management College, Manchester University and Newcastle University in the UK as well as Tongji University in Shanghai, China. He is a well-recognized expert in the automotive industry. He is consultant to International Organizations (EU, OECD, ILO, UNIDO), professional organizations (CCFA, FIEV, JAMA, CLEPA), OEMs (PSA, Renault, Toyota, Nissan, DaimlerChrysler, VW) and numerous component manufacturers. He is a member of the French Society of Automotive Engineers (SIA) and the GERPISA International Network of Researchers on the Auto Industry.

In April 2004, he has been granted the IAMOT award for research excellence in Technology and Innovation Management.

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Professor David Birchall is Director of the School for Management Knowledge and Learning and Henley Learning Advisory Service at Henley Management College, UK.

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# Product development with a focus on attractive product expression: a case study analysis

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## 1 Introduction

Products can transmit messages that are meaningful to users, for example, by communicating status or by evoking personal memories. Different research approaches are possible to examine product development activities leading to a communicative product design. A first research approach consists of categorising the different messages that a product allows to communicate. A second research approach might analyse the methods used to identify the users' preferences for communicative product aspects. In the third place, research can focus on examining how to incorporate these requirements for communicative value in a product's design during the development process. This article gives attention to both the second and third research theme. It examines how two companies identified the preferences for product's appearance. It also investigates how these companies incorporated these user requirements in the product's design.

## 2 Literature

### 2.1 Terminology

In the literature, multiple terms are used to describe the communicative aspect of a product's design. Some terms directly refer to the product. This phenomenon is then called "product language" (Bürdek, 1996; Steffen, 2000), "product meaning" (Muller, 1997), "product soul" (Durgee, 1999) or "product charisma" (Gotzsch, 2003).

Another part of these terms refer to the reaction that a product elicits. The term "product emotion" is proposed by Desmet (2002) and "emotional domain", "soft functions" by McDonagh et al. (2000). Meaningful expression might also give the product an "added emotional value" (Desmet, 2002), provide the user with a

“product experience” (Marzano, 2000) or make the product “desirable” (Sanders, 1992).

## 2.2 Propositions for research

The design management and new product development literature do not specifically examine the creation of communicative design. However, when analysing the literature, several aspects appear relevant for the incorporation of messages in a product’s design. These research propositions are summarised in table 1 and discussed in the following text.

proposition 1	Competition is a major driver for the creation of a communicative product appearance
proposition 2	A positive attitude towards design in the organisation is important for the creation of a communicative product appearance.
proposition 3	A cooperative, multifunctional team with appropriate and sufficient design skills is important for the creation of a communicative product appearance.
proposition 4	User focus in the pre-development stage to understand the users’ preferences for the product’s aesthetics and significance is particularly important for the creation of a communicative product appearance.
proposition 5	As part of a quality design process, the identified preferences for “product expression” have to be translated into a communicative product appearance.

Table 1: The research propositions

In the first place, *competition can act as a driver* (see table1, proposition 1) for the creation of a communicative design. Cooper and Kleinschmidt (1995) established the importance of the superiority of a product as key success factor. Cote-Colisson et al. (1995) and Potter et al. (1991) specifically validate the role of design in differentiating a product from competition. Marzano (2000) and McDonagh-Philp et al. (2000) confirm that with more products available, consumers specifically attribute importance to the product’s emotional quality. In other words, the presence of competition pushes a company towards the

creation products that differentiate from competition. Incorporating communicative qualities into a product's design allows such a differentiation.

In the second place, the literature indicates that the design management process is helped by an open-minded attitude towards design at all levels in the organisation (Bruce and Cooper, 1997; Cote-Colisson, 1995) and an innovative culture with openness to change and encouragement for innovation (Bruce and Cooper, 1997). An *positive attitude towards design* (see table 1, proposition 2) is, therefore, expected to facilitate specific aspects of the design process, such as the creation of products with communicative value. Additional factors found to facilitate the design management process are experience with design and care for product details (Bruce and Cooper, 1997), importance given to aesthetics (Freeze, 1990), a strong company or brand identity and a drive for continuous product improvement (Hart and Service, 1988).

The commitment of people involved in the project and design professionalism (Bruce and Cooper, 1997), small, close-knit, multi-disciplinary teams (Hart & Service, 1988; Bruce & Cooper, 1997) with regular and good communication, mutual respect and harmony were found as key factors for the quality of the development project. The *design skills within a cooperative multifunctional team* (see table1, proposition 3), therefore, seem to be important for the creation of products with communicative value.

Cooper and Kleinschmidt (1995) highlight the importance of pre-development activities in product development. A "customer focused process" and "home-work" that is well done before the development process, are crucial. The importance of an early user-orientation is also pointed out by Hart and Service (1988) and Bruce and Cooper (1997). To develop communicative product design, it therefore seems vital, to *understand the users' preferences for product appearance* (see table1, proposition 4).

Decision-making qualities are important for a high quality development process (Cooper and Kleinschmidt, 1995). This process must be protected by high

positions in the organisation (Calantone et al., 1995). Companies that create products with communicative value, probably intend to create the best possible product for their users. It is, therefore, assumed that they use a quality design process to *incorporate the users' preferences for product expression* into the design (see table1, proposition 5).

The above research propositions were specifically examined in the field research phase of which the methodology is described in the following section.

### 3 Methodology

This study investigates how the creation of a communicative design takes place. It has an exploratory character. The case study method was selected as an appropriate approach and a structured interview guide with open and semi-directed questions was developed.

Interview structure				
		Theme	Main question	Details
A		General information	About the company About the interviewee	Name, size, products, ... Role in project, background in design, ...
B	p2	Company culture	Design in your company Innovative culture	Position, origin, attitude
C	p1	Product / project choice	Short product history Strong & weak points	When developed, competition...
D		Development process Expression used	Open question	
E	p4	Pre-development process	Method to identify need for expression	Source, objective, who, ...
F	p5	Creation process	What took place	Who, how, decision process, ...
G	p3	R&D resources	People Time (budget)	
H		Facilitating & constraining aspects	Which aspects facilitated or constraint the process	
I		Results	Consumer reaction Product personality: details Commercial results Company learning process	Expected / surprise Product messages Market position, financial, other results, ...

Table 2: Structure of interview guide

The interview started with *general information* (see table 2, A) about the company and the interviewee, such as the interviewee's background, role in the project and experience in design. The next theme concerns the *company culture* (table 2, B) and the position of design in the company. The following questions *focused on a specific project* in the company (table 2, C). The history of this project and its product development process were examined in open questions. Detailed questions about the *pre-development* and *product creation* activities followed (table 2, D, E, F, G, H, I). The questions in the interview guide were directly related to the research propositions. This is indicated as p1 to p5 (proposition 1 to proposition 5) in table 2.

Two pilot studies took place to test this interview guide. This allowed confirming the duration of the interviews and verifying details such as the use of the tape-recorder to register the interviews. Six in-depth case studies followed. The type of products that were selected for the case studies were consumer products for use in a "*home environment*", such as products used in the living room, kitchen or bathroom. From the above category, products were chosen with which a consumer normally is in *regular physical contact*, because this makes the affective contact with these products more important. The companies are operating in competitive markets.

For each project, several designers, design managers or product / marketing managers were interviewed. Before the interviews, publications about the projects were collected. The case studies were written, based on the information from the interviews (kept on notes and audio tapes) and completed with the additional publications. The case studies describe the product development process and focus on conditions and activities in the product development process contributing to the creation of product expression. The case study description depended on the information that was obtained from the multiple sources. Each case description has, however, the following structure: project origin, product expression, product development process and future of the project.

The interviewees were asked to verify the written summary. A double check was made by asking other participants in each of the six projects to review the text.

In two of the six projects, it appeared that the companies specifically aimed to integrate an attractive user-centred expression in the design. These are the two projects that are described and analysed in this article.

#### **4 Results**

The two selected projects originated in very different companies. One is a multinational company with an important in-house design team. The other is a small independent design consultancy.

Company A has its headquarters in the Netherlands and is, with approximately 10,000 employees, part of a much larger multinational group. Company A commercialises small domestic consumer products and works with an internal design team. This internal design team is part of the company's design department with 500 employees. Between 1997 and 1999, Company A developed a range of small kitchen appliances (see figure 1).



*Figure 1: Products of the kitchen appliances range*

The second company (company B) is a French design agency with approximately 20 employees. One of its clients is a multinational company, specialised in dental care products. From 1990 to 2000, this agency designed three children's toothbrushes for this client (see figure 2).



Figure 2: Three generations of toothbrushes (left) and the toothbrush with suction cup (right) - photograph: B. Moyen –Lucy in the Sky, Annecy

## 4.1 Influence of competition

### 4.1.1 Proposition 1: Competition as a major driver

Competition pushed the multinational Company A towards product differentiation. Company A's market is very competitive and the success of this range of kitchen appliances was of strategic importance. Design is a major sales argument for small kitchen appliances within this price segment. Improving the functionality of these "mature" products is difficult. Improving the products' appearance, however, still offers opportunities. An extensive international trend and market research took place to identify the visual preferences of its user group. The users of these small kitchen appliances were described as "quality-oriented traditionals". They were portrayed as mature,

high-end, quality-oriented consumers that appreciate design, but that are quite suspicious when confronted with radical changes. The products had to be specifically appealing to this group of users. During the product development process, colours and shapes that refer to traditional kitchen materials such as ceramics and metals were selected. The products were designed to communicate good quality. They had to look modern, but not revolutionary.

A search for product differentiation also motivated the second company in this case study, the independent design consultancy (company B), to propose a “lively” toothbrush. This product has a small base “with feet” and was specifically designed to please children (see figure 2, left – front). At the time, children’s toothbrushes used to look similar to those for adults. This very different “playful” toothbrush design was a commercial success, since it increased the client’s European market share from 8% to 42% in 1991. Competition simply ignored this opportunity at the time.

The design team continued to make the design of the three toothbrushes attractive for children. A second toothbrush “with arms” replaced the first design in 1994 (see figure 2, left – back). The brush itself remained unchanged, but its support had feet and arms integrated into its design. A third toothbrush with a “suction disc” that adheres to tiles was launched in 1997 (see figure 2, right).

*To be competitive, both companies needed a desirable product. They used a user-centred approach to create a product appearance, intended to be specifically appealing to their clearly identified users. Creating an appearance dedicated to such a user group proved to be a good strategy, especially because competition underestimated or ignored this possibility at that moment.*

## **4.2 Company culture and design skills**

### *4.2.1 Proposition 2: The importance of a positive attitude towards design*

Within Company A, design has a high standing. The marketing department works closely with the internal designers. Company B’s client, on the other

hand, had little experience of working with product designers, but its marketing manager was open to design solutions.

*The creation of a meaningful design, therefore, proves possible in a company that does not place design on a strategic level (yet), but that has an innovative open-minded attitude towards design. Design experience, however, might become crucial when competition is also focusing on this design aspect.*

#### *4.2.2 Proposition 3: Design skills in a cooperative, multifunctional team*

Company A has a product division specifically responsible for coffee-makers and another one responsible for food-preparation products. Both divisions were in financial difficulties around 1997. A new Business Unit Manager encouraged changes in the organisation in an effort to overcome these problems. This stimulated the marketing managers of the coffee-makers and the food-preparation products to develop a common marketing strategy. The design department also used a new and innovative approach by working with trend watchers in New York, Paris and Tokyo. The objective was to obtain a clear vision of trends in colours and styling that could appeal to the user group. This mixture of innovative marketing people, quality design skills, and new research in marketing and design appeared decisive in this project.

In Company's B toothbrush case, the role of the design consultancy team and their client's marketing manager was important. A small team with creative ideas and a limited budget worked on the project.

*In a multifunctional team, the cooperation between marketing and design executives appears a real condition for a successful project. The professional quality of the team members is important to define and obtain a precise "feeling" of what is needed in the market and to incorporate this into the product's design. These characteristics, however, seem to be fundamental for every product development project and not only for the creation of a communicative design.*

### **4.3 Product development activities**

In the projects, different methods were used to identify the product appearance that users might prefer. Company A did extensive market and trend research before the development phase. Company B used spontaneous idea generation and involved users (in this case children) during the creation process.

#### *4.3.1 Proposition 4: understanding the users' preferences*

Company A analysed its market and obtained profound knowledge of its target consumer before the development process. Styling characteristics that would appeal to these users today and in 3 years time were examined in different countries by trend analysts. For company A, it was new to place so much emphasis on market and trend research. Company B used a much "lighter" user-centred approach. During a brainstorming session, the idea was developed to create the product in a style that appealed to children.

*A user-orientation is necessary to understand preferences and sensibilities of the product users. Serious competition appears to create the need for profound and extensive user-focused research.*

#### *4.3.2 Proposition 5: the importance of a quality product development process*

How are the user's visual preferences translated into product design? Company A changed the organisation of its project teams, to enable one dedicated team to develop the entire product range for a specific user group. Before this re-organisation, teams were specialised in developing one specific type of product. A marketing manager was made responsible for the coherence in quality and appearance of the total product range. The project team felt confident during the product development phase. They sensed that the initial market and trend analysis studies were well done. Hardly any product testing was used.

Company B "only" used the team's creativity to create the first toothbrush. Three years later, competition also started commercialising attractive toothbrushes for children. As a response to growing competition, a budget for

research was made available and children were involved in the project for idea development.

*The methods used by the companies differ. Company A committed a project team to the product range. The organisation moved from an organisation based on a product type to one based on the entire product range dedicated to specific users. The team used the information from the pre-development research. Company B did no pre-development research for the design of the first successful toothbrush. They used a simple creative user-centred approach within the development team. They imagined what would appeal to children and their parents. But when a few years later competition intensified, users (children) became involved in the creation process.*

## **5 Discussion**

### *5.1 Conclusions from the cases*

It appears that there is evidence to support the claim that competition acts as a major driver to develop products with communicative value. A product appearance having meaning to its user seems an effective approach to add value to the product. The aspects in a product's design, that a company might choose to pay specific attention to during the product development process, depend on multiple aspects. This choice depends on many variables; the users' preferences, the degree of competition in the market, the competitor's design strategy, and on other possibilities to integrate advantages, such as functional improvements, technical excellence and price aspects.

A positive attitude to design (proposition 2) and design skills in a cooperative multifunctional team (proposition 3) appear very important for a successful product creation process, but are not specific for the development of communicate design.

However, to develop a product appearance that is attractive to its users, it appears crucial to have a creative focus on the users' preferences during the pre-development phase and the creation process (proposition 4 and 5). Research in this pre-development phase might make use of different techniques such as brainstorming, market and trend research, depending on the budget and the degree of competition. In the creation process, user involvement can be a source of additional ideas for the creation of a meaningful design.

## *5.2 Limitations and further research*

The conclusions are based on two successful product development projects. These two projects were chosen from the six case studies, because these two specifically focus on creating an appearance having meaning for the product user. The other case studies aimed at differentiating the product by using other methods, such as improving the product's functionality or concept. This number of cases is too limited to generalize the findings. The two companies in the case studies are also very different, because one case concerns the in-house design practice of a multinational company (company A) and the other involves a small independent design consultancy (company B), working for a multinational client. It will be a next step in research to examine how other companies handle the development process of communicative meaningful product designs. It is an important process, because it is an additional, underestimated way for product differentiation that allows bringing commercial success in competitive markets.

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