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## The communication strategies and customer's requirements definition at the early design stages: an empirical study on Italian luxury automotive brands.

Konstantinos Stylidis <sup>a,\*</sup>, Monica Rossi <sup>b,c</sup>, Casper Wickman <sup>a,d</sup>, Rikard Söderberg <sup>a</sup>

<sup>a</sup> Chalmers University of Technology, Department of Product and Production Development, 412 96, Göteborg, Sweden

<sup>b</sup> Department of Management, Economics and Industrial Engineering, Politecnico di Milano, Via Lambruschini 4/b 20156, Milano, Italy

<sup>c</sup> Department of Management, Information and Production Engineering, University of Bergamo, Viale Marconi, 5, Dalmine (BG), 24044, Italy

<sup>d</sup> Volvo Car Group, Craftmanship & Ergonomics Centre, 91300 PVÖS35, 405 31, Göteborg, Sweden

\* Corresponding author. Tel.: +460317728284. E-mail address: [stylidis@chalmers.se](mailto:stylidis@chalmers.se)

### Abstract

At the early stages of the product development, it is important to set up customer's requirements and translate these into the technical specifications with the highest level of precision since the changes in the late design phases have extremely high cost. These requirements are directly dependent on the correct and complete definition of perceived quality attributes. Such attention to the details is vital for the luxury car manufacturers since they are seeking to fulfill customer requirements with the high level of personalization. This research based on the perceived quality framework and presents findings from the empirical study of leading Italian luxury vehicle manufacturers. This research contributes to the existing debate regarding the correct definition of the customer's requirements and communication strategies. Moreover, it highlights possible ways to reduce information asymmetry between car manufacturers and customers.

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### 1. Introduction

Over the last decade the luxury market has shown a remarkable growth [1] and the luxury automotive manufacturers traditionally have been an important part of this market. Therefore, to stay competitive and increase customer's demand, the luxury automotive manufacturers need to focus on customer's requirements as early as possible in the product development processes [2]. A requirement can be defined as "a request that a product fulfills certain properties or functions" [3]. Also, a requirement consists of a describing attribute and a defining value, quantification, and can be posed consciously or unconsciously by any person that is recognized as stakeholder [3]. As a matter of fact, luxury automotive manufacturers always had a customer-centric approach to product development, and there would be no reason to investigate this

topic if the concept of luxury would not change so rapidly.

The term "luxury" is a quite fuzzy concept and usually associated with the particular products, services or lifestyle [4]. In the past, key characteristics for the luxury automotive manufacturers was exclusivity, aesthetics, design, brand history and heritage. The aspects of manufacturing quality were not necessarily prioritized in the past since the customer was attracted with the emotional or hedonic value in the first hand. The traditional marketing approach is usually brand-centered, and value was proposed for a customer to accept or decline without active involvement. However, in the recent past, the emphasis has shifted to the active participation of the customer in the process of value creation [5], [6], [7].

There is to mention, that the premium segment of the automotive industry traditionally excelled in the high manufacturing quality and today in this segment the perceived quality is the major determinant of the customer purchasing decision [8], [9], [10].

In this study, with the help of qualitative analysis, we find a preliminary evidence that:

- Customers of the luxury vehicle manufacturers have been actively involved in the setting up requirements and expect the same level of the perceived quality as in the premium segment.
- Luxury vehicle manufacturers benchmark their products not only against competitors but rather against premium segment.

The evidence that was found could bring certain complications regarding the communication strategies implementation and set up of customer's requirements for luxury vehicle manufacturers. There is to mention that the company's communication strategy can be seen as a pattern in the decisions and actions regarding the requirements definition which can influence relationships with stakeholders [11].

Such problems arise from the fact that product designers and engineers often do not interact with the customers directly [12] and the customer's preferences often translated into the requirements in the highly subjective manner [13]. As the result customer needs and preferences regarding allocation or ranking of the various perceived quality attributes are "lost in translation," often implicit and poorly communicated [14]. Luxury vehicle manufacturers need to understand which perceived quality attributes are important for their customer and how these could be successfully translated into requirements so that the customer will have a higher quality perception of the product.

Assuming that luxury vehicle manufacturers can inherit existing problems within the communication strategies and challenges regarding setting up of customer's requirements from the premium automotive sector we propose the use of the Perceived Quality Framework [14].

To appropriately catch customer requirements at the early stages of product design and development is paramount to avoid costly design changes later in the process [15], [16], [17]. To deliver a successful product requires customer's requirements to be carefully investigated during the so-called front-end design and product platform planning [18]. Not only customer's requirements should be properly captured, but also, these should be weighted in terms of their relative importance from a customer perspective and accurately transmitted to the overall design process. Formal processes of requirement definition and management exist in various

dominos with the name of *requirement engineering* [3], [19].

Requirement engineering guarantees (i) all relevant requirements are explicitly known and understood at the required level of detail, (ii) agreement on the requirements exists between the stakeholders involved, and (iii) the requirements are documented. Commonly, a requirement engineering process includes the phases of elicitation, analysis, specification, validation, and management [19], [20].

Requirement engineering represents a pivotal phase in the design process and has been recognized paramount for a successful product development. However, companies from premium segment have time and cost constraints that often limit them to go accurately through complex requirement engineering process. These lead companies in the premium segment to be often imprecise in customer's requirement definition and misaligned with perceived quality attributes. When benchmarking with premium segment – as we are experiencing this trend in practice – companies from luxury car segment should carefully avoid same mistakes, and take advantage of their lower time and cost pressure advantages.

Companies from the luxury automotive sector can find support on the Perceived Quality Framework [14] to base their requirement engineering process efficiently and more.

This paper is structured as follows: Section 2 introduces the qualitative methodology used in this work; Section 3 discusses early findings and provides recommendations for further research; Section 4 presents conclusions.

## 2. Methodology

The research design implemented in this article is rather exploratory in the form of pilot study. We used Grounded theory methodology through the analysis of received data [21]. Main reason behind the choice of methodology was the fact that luxury automotive manufacturers unlikely to share data with public and chances to conduct the prior analysis of the available data are very low.

The pilot study includes interviews with senior designers and engineers of two Italian luxury market automotive manufacturers that explore their processes of customer's requirements definition and understanding dimensions of the perceived quality. This study includes only a preliminary results.

For data collection, we used semi-structured interviews. There are many forms of the interview design, and typically an interview study can be classified as an unstructured interview in the form of informal conversation, structured interview, and a semi-structured interview with the open-ended and follow-up questions [22]. The semi-structured

interviews usually include elements from both structured and unstructured interviews. “A fixed set of sequential questions is used as an interview guide but additional questions can be introduced to facilitate further exploration of issues brought up by the interviewee, thus almost taking the form of a managed conversation” [23].

### 2.1 Design of the study

We interviewed four professionals from the two Italian vehicle manufacturers in the luxury segment of the automotive industry. The reasoning behind the selection of the interviewees was the opportunity to obtain a holistic view regarding the company’s methods and approaches for defining customer’s requirements and addressing perceived quality issues. A secondary objective was the determination of perceived quality attributes and their dissemination among different departments within the companies.

The average length of each interview was about 60 minutes. Interviews were carried out in English. Interviews were voice recorded and transcribed to text. Text coding and analysis was performed with the NVivo qualitative data analysis software [24]. The data analysis was performed by the two researchers independently. The inter-coder agreement was calculated with the Cohen’s Kappa [25]. The values of Kappa were calculated for each node individually and remained within the range of 0.35-0.80; which can be seen as a good agreement.

Questionnaires were created to reveal the interviewee’s opinion on customer’s requirements definition, perceived quality, determination of perceived quality attributes, communication strategies, subjective importance rating among different perceived quality attributes and areas, and knowledge sources regarding various complications in communication with the customers and feedback.

At the beginning of the interview, questions were quite open and general. For example: “*What is perceived quality from the designers’ point of view?*” and “*What are the prerequisites for a good perceived quality?*”

The subsequent questions narrowed the interest to mapping perceived quality attributes and addressing customer’s requirements definition. For example: “*What perceived quality attributes determine visual quality?*” or “*What attributes, in your opinion, are important for the vehicle exterior and why?*”. During the interviews, the authors sometimes had to ask additional questions to explore topics widely and determine perceived quality attributes clearly. For example: “*So how did you get feedback from the customers?*”.

During the data analysis, the material was organized into topic areas (or ‘nodes’): (1)

perceived quality, i.e., data related to the perceived quality; (2) competitors, i.e., data regarding benchmarking strategies; (3) manufacturing process, i.e., data related to the specific manufacturing processes such as surface finish standards; (4) perceived quality attributes, i.e., data regarding particular perceived quality attributes; and (5) shift to premium, i.e., new phenomena derived from the interviews. (6) requirements definition, i.e., data related to the customer’s requirements set up; (7) communication, i.e., data regarding communication strategies. Throughout the analysis, we used a bottom-up approach: Reading the interview data and creating codes as they appeared; for example, the above seven nodes is a result arisen from the data analysis.

The interviews provided us with information regarding luxury automotive companies and their view on requirements definition, perceived quality and communication strategies. We were able to identify new trends in quality perception and communication strategies for the luxury market segment of the automotive industry.

### 3. Discussion and results

The interviews revealed several interesting trends. Both companies see perceived quality as a relatively new area that they have to take into consideration. Traditionally both companies have well-established ways of capturing individual needs of their customers and translations of those into technical specifications, however, as probably every luxury brand. There is to mention; both companies also have “iconic” features that remain unaltered.

In Table 1, the nodes derived from the interview data are mapped against two luxury automotive companies (Luxury Manufacturer 1 and 2) with the number of quotes related to each node. The table shows a correlation between coded data for both companies. This phenomenon can be explained by the fact that objects of the study belong to the same segment of the automotive industry and have a similar approach to the perceived quality issues, a definition of customer’s requirements and communication strategies.

Table 1. Number of quotes related to nodes of interest for two Italian luxury segment vehicle manufacturers.

Node	Luxury Manufacturer 1	Luxury Manufacturer 2
Perceived Quality	36	22
Competitors	3	0
Manufacturing processes	12	12
Perceived Quality Attributes	17	10

Shift to premium	3	3
Communication	2	6
Requirements Definition	8	5

The word frequency analysis for the 1000 most frequent words shows that for the luxury segment the most important factor is the “quality” that is followed by the words “customer” and “difference”. In the context of the interviews, this factor addresses how important for the companies in the luxury segment to satisfy customer’s needs. The received data also provides evidence that manufacturers struggle with the dilemma which components of the complete vehicle comprise luxury: where should money be spent and which perceived quality attributes make a difference for the customer [26]?

*3.1. Preliminary finding 1 - Customers of the luxury vehicle manufacturers have been actively involved in the setting up requirements and expect the same level of the perceived quality as in the premium segment.*

Traditional view of the luxury states that “... key characteristics of luxury brands include a perceived high price; excellent quality; exclusivity and uniqueness in the sense of scarcity or severe availability; aesthetics of form and colour; a long history and the reputation of a holistic and continuous brand presence; and non- necessity, as symbolic values which dominate over the functional characteristics.” [4], [27].

Though, interview data revealed that “premiumness” become a predecessor for luxury. Perceived quality requirements and attributes have become extremely important for luxury vehicle manufacturers.

The data showed the new understanding of the luxury vehicle manufacturers that they need to make luxury vehicles comparable to the premium segment vehicles concerning functionality and quality. Specifically, the luxury car is usually the second vehicle for the customer. Moreover, this second vehicle is what a customer typically uses during the weekends to provide a unique experience. As a result, the customer expects a similar level of perceived quality in the luxury vehicle as in premium.

It is also necessary to understand the difference between how luxury vehicle manufacturers are collecting the customer feedback in contrast to the premium segment. Significant differentiation was revealed during the interview data analysis. Traditionally, the Italian luxury manufacturers are in very close contact with their individual customers. Companies receive feedback from

interviews with the customers during the lifetime of the vehicle. A dedicated group of engineers continuously perform face to face interviews and vehicle assessment after the sale period. Another valuable source of information is jury tests or use of Delphi Method [28] usually performed with selected luxury car dealers.

In contrast premium vehicle manufacturers often rely on the quantitative data received in the form of different customer studies e.g. clinics, surveys and focus groups. Premium vehicle manufacturers also struggle with the question: “Which perceived quality attributes make a difference for the customer?” This fact has to be considered by the luxury vehicle manufacturer at the stage of customer’s requirements definition.

*3.2. Preliminary finding 2 - Luxury vehicle manufacturers benchmark their products not only against competitors but rather against premium segment.*

Concern emerged from the data analysis that customers could not find in a luxury vehicle the commonly expected features and functionality they have in their first car (usually from the premium segment). This fact becomes the reason for customer complaints. As the result, today’s leading luxury automobile manufacturers are benchmarking their vehicles not only against the competitors in the same segment but also against the premium vehicle manufacturers.

*3.3. Future work and Limitations*

In the final analysis, we presume that luxury vehicle manufacturers can inherit existing problems within the communication strategies and problems regarding setting up of customer’s requirements from the premium automotive sector. A possible solution regarding improvement of communication strategies and better understanding of customer’s needs could be implementation of the Perceived Quality Framework [14] in the design practice from the beginning of the product development process. Interviews revealed that Italian luxury manufacturers seek the ways of better understanding dimensions of the perceived quality and proposed framework can serve as a basis for mapping and assessment of perceived quality attributes.

After all this pilot study will be extended in the future including other luxury vehicle manufacturers from Europe and USA. The quality of the data analysis also will be improved with the more coders included into the study.

There is a number of limitations in this work. First, we focus only on two Italian luxury automotive manufacturers. Second, we focus only on automotive designs, so our preliminary findings are less clear for other luxury goods.

#### 4. Conclusions

Successful automotive design starts with accurate product requirements definition, able to fulfill customer needs by focusing on perceived quality design attributes. The process of defining and managing product requirements, though, is not trivial and could lead the whole design process to unnecessary activities, over time expenditure, and cost overrun when too strict tolerances, or too tight constraints are included. To overpass such problems, the vehicle producers should focus on deep requirement understanding since the very beginning of the development phase.

However, this is not always the case, and inefficiencies in this perspective are often encountered. While in the luxury segment late engineering changes and cost and time overrun are still admitted, this is not the case for the premium segment, where once set, the requirements cannot be modified. This phenomenon brings to the marketplace vehicles that are not 100% compliance with customer needs/expectations and the need to quickly define customer requirements lead to poor perceived quality attribute accomplishment.

Moreover, the preliminary results obtained in this study suggest that there is a shift in the customer expectations, and customers now expect in the luxury segment the same level of the perceived quality as in the premium segment. This led luxury car manufacturer to benchmark their vehicles not only against competitors but especially against premium segment.

This pilot study has been conducted within two Italian automakers in the luxury segment, through semi-structured interviews. A strong message emerging from the interviews is that customers of luxury cars – always second owned car – expect luxury vehicles to have at least same quality as their first vehicle, i.e. a premium segment car. Therefore, luxury car producers start benchmarking their product quality attributes with premium vehicles.

This approach clearly relies on vague fundamentals. In fact, quality attributes in premium cars do not precisely reflect customers needs, and this could be strongly misleading for luxury automakers that might find themselves to include – as a result of a wrong benchmark analysis – perceived quality attributes the customer does not care about. Consequently, in this process of including premium features in their design constraints, luxury cars automakers need to be guided in their requirement engineering process to

guarantee the included requirements sincerely reflect the customer perceived quality attributes. Frameworks as the Perceived Quality Framework [14] effectively serve this scope.

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