

Analytical Craftsmanship-
Evaluation and Analysis of Consumer Perceptions

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Chapter 1: Introduction

“Why all this new effort on style as well as functionality? Most automakers now have the basic ingredients of good interior design pretty much down pat: ergonomics, safety, functionality and convenience items such as cup holders. The next step is imparting a feeling of customization and craftsmanship to the interior.” [Winter, 1997]

In today’s society, to compete and succeed in the marketplace effectively, manufacturers must look beyond fundamental reliability and physical quality, and pay more attention to product aesthetics and the subjective quality of their products [Liu, 2000]. Although product designers are well aware of the importance of craftsmanship, traditionally decisions are made simply on intuition. Part of the reason for this is the general lack of an established systematic or scientific method to make educated and accurate craftsmanship design decisions. As such, the goal of this research has been to systematically apply methods from the fields of psychology, statistics, and engineering to help identify and quantify the craftsmanship quality of automotive vehicle interiors.

1.1 Craftsmanship

There are many ideas concerning what is meant by the concept of craftsmanship. It has been said that craftsmanship is what makes a product have the immediate appeal of being well made and well functioning at its very early interactions with the customer. In other words, a product that is well crafted is one that, right from the start, comes across as being carefully designed, produced, and in addition there are no initial reasons to doubt the ability of the product to do its job well. It has also been said that the idea of craftsmanship is creating products that are skillfully created, lasting in nature and possessing a timeless elegance. In this way, attention to detail, material selection, careful workmanship and innovative product design are all key components [Wang, 2000].

Concerning products that are mass produced, industry has developed standards of quality in an attempt to give their products this sense of craftsmanship. From the definitions given above, and others however, it seems that craftsmanship goes beyond simple quality. Consider that the precise use of good machinery can produce many different products with perfect quality. What is it then that sets these technically ‘good’ products apart from those that are deemed to be well

crafted? It would seem that there must be something in the attention that is given to detail. Many products that are mass produced are simply designed such that they are easy to form. A product that is carefully designed and takes time and skill to produce requires extra attention and is thus more one-of-a-kind. Products that are carefully produced have also traditionally shown less inclination to fall apart or not work properly. Overall then one can infer that a product, even one produced on large scale, might be considered well crafted only if serious attention to detail is given in both design and production.

1.2 JD Power

JD Power and Associates is a global marketing information services firm that helps businesses and consumers make better decisions through credible, meaningful, and easily accessible customer-based information [JD Power]. Each year JD Power surveys millions of consumers about products in various industries which include automotive, commercial vehicles, telecommunications, travel, real estate, finance, marine, health care, utilities, sports, retailing, office products, and professional services.

In the automotive industry, the surveys are designed to provide information in the following areas:

- New-vehicle quality
- The shopping experience
- Sales satisfaction
- Brand loyalty
- Service satisfaction
- Emerging technologies
- Online consumer behavior
- Component quality
- Long-term durability
- Collision repair

For new-vehicle quality, JD Power uses an Initial Quality Study (IQS) to examine consumer satisfaction after 90 days of ownership. The IQS is broken down into two main sets of questions, Things Gone Right (TGR) and Things Gone Wrong (TGW). The TGR section asks the consumer, on a scale of 1 to 10, to rate various aspects of the vehicle in the areas of:

- Engine & Transmission,
- Cockpit and Instrument Panel,
- Ride, Handling and Braking,
- Heating, Ventilation and Cooling (HVAC),
- Comfort and Convenience,

- Sound System,
- Seats, and
- Vehicle Styling / Exterior

The TGW section then asks about specific problems in the same areas. These problems include issues such as ‘Not working properly,’ and ‘Squeak or Rattle.’ The data obtained from these surveys is then compiled and reports on each main vehicle segment are created. These reports include the Interior Quality Report (IQR), the Seating Report, and others. Once created, the reports are then available to be purchased by businesses world-wide to help them tailor their product to the needs of their consumers.

1.3 Thesis Intent

Objective Summary:

- 1) Determine those concepts that most influence the perception of a well crafted product via a case study on automotive interiors.
- 2) Evaluate the individual contribution of the concepts found above.
- 3) Determine the functional relationship of the critical factors to the perceived quality of the overall vehicle and overall interior.
- 4) Find the relative importance of each of the craftsmanship attributes.
- 5) Examine the attribute importances over time.
- 6) Develop predictions about the best distribution of resources between said attributes.
- 7) Apply the understanding of craftsmanship attributes from the case study to other products.

The primary objective of this thesis is to determine to what degree the subjective and intangible concept of craftsmanship can be analytically described. To this end, an in-depth analysis on the attributes that describe said concept has been done. In addition, mathematical models have been created that describe the overall quality of an automotive interior in terms of JD Power Interior Quality Report survey questions. The secondary objective of the thesis is to identify the elements of such an approach that can then be generalized to other areas. Using the methodology applied in this analysis of interiors, an outline has been created which can be applied to the subsequent analysis of additional concepts or products.

1.4 Thesis Overview

This thesis explores the development of a methodology to create an objectively mathematical model of the subjective system of craftsmanship. To familiarize the reader with existing work on the matter of subjective system modeling, Chapter 2 provides background on progress made by several different fields including psychology and engineering. Chapter 3 begins the case study on automotive interiors by outlining the system used by Johnson Controls Inc., and includes suggested changes to their list to make it more objective and quantifiable. The system of product characteristics is also mathematically broken down into independent subsystems to aid in conceptual evaluation. Chapter 4 then introduces the JD Power system of variables, and relates them to the JCI list. Partitioning is again done to break the large system up into smaller subsystems. For comparison between the two methods, Chapter 5 describes the rating comparison done between JCI-assigned scores and the JD Power survey data. Subsequently, Chapter 6 discusses the JD Power model in greater depth, including the selection of variables, the regression analysis, and the application of attribute combinations and transformations. Chapter 7 looks at the change in category rank status over the years of 2001 to 2003 and makes predictions about the year 2004. Finally, Chapter 8 discusses the implications and applications of the findings made thus far. The results of the interior case study are given in their functional form, applied in a budget spreadsheet, and correlated back to the JCI variables. To wrap things up, the process used in the case study is then generalized as a procedure that can be applied to the analysis of other products.