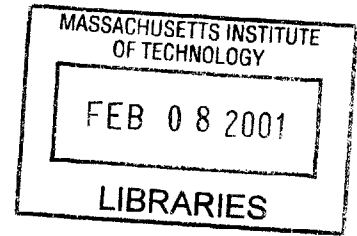


Developing Product Requirements through the Voice of the Customer and their Link to Product Development – A Mustang Study

BARKER

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SUBMITTED TO THE SYSTEM DESIGN AND MANAGEMENT PROGRAM
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN ENGINEERING AND MANAGEMENT
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

FEBRUARY 2001

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ACKNOWLEDGEMENTS

I want to say thank you to the individuals that contributed in part, with time, support and experience, which allowed me to complete my thesis:

First I want to thank my wife, Sandy. It was through her support, patience, encouragement and understanding throughout the entire program that helped keep me going. The program provided many challenges and through it all she was always there for me. Thank you.

Professor Drazen Prelec from the Sloan School of Management. I want to thank him for his guidance throughout my thesis work. His knowledge and industry leading techniques were very helpful and enhanced the learning process.

I want to thank Ford Motor Company for allowing me to pursue this unique advanced degree. I also want to say a special thank you to Tom Bochenek, my supervisor, Paul Giltinan, my manager and Janine Bay, my director for their efforts and belief in me on my nomination to the MIT/SDM program.

Finally, I want to say thanks to the students of the SDM-99 class. At the beginning of the program many of us did not know each other, but in the end we became great friends.

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Submitted to the System Design and Management Program
On December 21, 2000 in Partial Fulfillment of the
Requirements for the Degree of Master of Science in
Engineering and Management

ABSTRACT

The move toward Customer-Driven Product Development is changing the way companies operate their business and is re-defining future products. For example, phrases such as: *Connecting with Customers*, *Customer First*, *Customer Focused Strategy* and *Customer Focused* are all strategies being adopted by Ford Motor Company to help their products meet the needs of customers. The focus on customers has become a top priority within the organization through top down and bottom up implementation. Product requirements developed from the voice of the customer can provide valuable insight into the critical customer needs for a product.

The ability to obtain, understand, analyze and incorporate those customer requirements into the product development system is critical to the success of a product. The challenge is developing a framework for gaining customer-voice data, analyzing that data, developing product requirements and linking those requirements to the product development system while meeting the objectives set forth for the product. The process requires an understanding of the product, engineering knowledge to develop and analyze product requirements and a familiarization of the product development process within a company. The product requirements developed from this study provided insight into the critical areas of the Mustang with customers. The effect of product requirements from the voice of the customer is moving organizations toward customer-driven product development and is changing the way business is done. This thesis provides a method to gain the voice of the customer, utilizes a framework for development and analysis of product requirements and links those requirements to the product development process.

Thesis Supervisor: Drazen Prelec

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Chapter 1

1.1 Introduction

The companies of today have put strong emphasis on understanding the needs of customers. The voice of the customer has become a way of doing business within companies. The ability to meet the needs of customers can be the difference between the success or failure of a product in the market. Ford Motor Company has taken many initiatives to try and get closer to its customers. Phrases such as: *Connecting with Customers*, *Customer First*, *The Customer is Job#1*, *Customer Focused*, *Customer-Focused Strategy* have all become commonplace from upper management down through the Ford Motor Company organization.

"We're committed to reaching new levels of success. We'll do it by accelerating our teaching and learning efforts company wide. Our strategy is simple. Employees satisfy customers. Satisfied customers reward shareholders."

"A customer-driven company must be relentless in its focus. It must listen to customers, find ways to fill their needs, and continually seek feedback on how well it is satisfying those needs."

"To get closer to the customer, our people must have information fast, unfiltered and close to where the decisions are made. So we've taken the next evolutionary step in our organization structure and realigned our worldwide operations into Consumer Business Groups centered around brands or regions. This complements our global scale and structure and better connects us with consumers."

*Customer focused and shareholder driven,
Jacques A. Nasser
President and Chief Executive Officer
March 9, 2000*

"Connecting with customers doesn't just happen. It comes from understanding who they are today and designing products and services -- and a way of doing business -- for where they'll be tomorrow. The

Consumer Insight Experience is one of the key initiatives that provide cross-functional groups of Ford employees with the state-of-the-art tools and techniques needed to obtain unfiltered communication with customers."

"Ford Motor Company enters the new millennium with a clear vision to become the world's leading consumer company for automotive products and services. This strategy puts customers first in everything the Company does. By leveraging our sources of competitive advantage, we continuously drive to improve, transform and grow the business."

1999 Ford Annual Report

In an effort to get closer to customers, companies are changing they way they do business by bringing the voice of the customer into the decisions they make on their products. The recent focus among companies is to talk directly with customers and let them express their needs for a product. In order to gain the voice of the customer, companies continue to use traditional methods such as surveys, customer visits and focus groups. The latest trends in the market are also using the Internet to gain knowledge about their customers. I am not convinced the Internet is a better method over the traditional methods, but it has its own unique place in today's industry. The impact of the voice of the customer has taken on the role of driving corporate strategies and marketing decisions in the companies of today.

1.2 Mustang, A True American Icon

The Mustang was introduced to the public on April 17, 1964 at the New York World's Fair. Little did Ford Motor Company know with the introduction of the Ford Mustang an evolutionary change in automobiles was in the making.

The Ford Mustang would go on to become one of the most recognized brand names in the automotive industry. The individuals behind the Mustang idea were Lee Iacocca, Head of Ford Division, and Henry Ford II, President of Ford Motor Company at the time. The introduction of the Mustang was a marketing triumph for its time. Part of the promotion for the vehicle came from Newsweek and other publications that were given early photos of the vehicle. In order to gain positive reviews, vehicles were loaned to journalists and reporters. An estimated 29 million people were introduced to the Ford Mustang through television advertisements bought on three major networks and shown the night before the world's fair. The day after its introduction, 2,600 major newspapers either ran advertisements or stories about the vehicle. As a result of Ford's intense marketing efforts, the Mustang had 22,000 orders on the first day it went on sale to the public. Ford had estimated that they would sell 100,000 Mustangs in its first year on the market. Little did Ford know that they would need only four months to meet their first year goal. At the end of the first model year, total sales of the Mustang reached 680,989 vehicles. The one millionth Mustang was produced by March of 1966. The introduction of the Mustang in 1964 was the rise of the true "American Ponycar."

The late 1960s began another transformation of the Mustang. The availability of bigger engine options and names like Shelby and Boss were offered to the public. The Mustang also sparked offerings from competitors such as the Chevy Camaro and Chrysler Barracuda. The muscle-car market was booming and the demand for powerful performance cars was in high

demand. In the early 1970s, the government introduced stricter emissions standards and front-and rear-impact requirements for vehicles. As a result, the Mustang took a transformation into a bigger and heavier vehicle in its early 1970s models. The oil crisis of the 1970s began to change the muscle-car market. The demand for better fuel economy was changing the market place for the Mustang and its competitors. In an effort to meet the demands, the Mustang was offered with a 4-cylinder engine. In the late 1970s through the 1990s the Mustang went back to its roots by offering big eight-cylinder engines again and reverted back to the classic Mustang style from its first introduction. The introduction of the 1999 model year Mustang, marking the vehicle's 35th anniversary, proved to be another remembrance of the past successes. Vehicle sales volumes for the 1999 model year surpassed Ford's expectations once again. The Mustang phenomenon, more than 35 years later, is still as strong today as it was back in 1964. Over the years, the Mustang has become known for its power, sporty look, heritage and its true American image.

1.3 Motivation

The motivation for this study was to investigate how the current Mustang meets the needs of its customers in the market. The Mustang target customer is not only in one category. The potential customer for the Mustang ranges from young to old, male and female and spans around the world in many different countries. In looking at the current Mustang's success in the market, I wanted to get a better understanding of customer likes or dislikes about the

vehicle. In addition, I wanted to gain an understanding of the future customers' needs for the Mustang. The voice of the customer can provide valuable insights into the needs of future Mustang customers and the goal of this study is to better understand those needs and develop product requirements for analysis.

1.4 Thesis Objective

The objective of this thesis will be to take a thorough look into the eyes of the Mustang customer and gain an understanding of their needs for the vehicle. The process involves customer interviews and vehicle drives to help in obtaining the voice of the customer. The customer needs will be analyzed and translated into requirements. The product requirements will be analyzed and linked to the product-development process using the Kano Model of customer satisfaction. The Kano model will identify the customer requirements that can have the most impact on the product and its customers. The voice of the customer can be a powerful tool to shape the development process for a new product. Companies must ensure the data they are getting from the customer is in line with the objective of the project. In many cases, customer data can be biased or tainted if the customer is unsure about the questions being asked during an interview, for example. The process that will be undertaken in this study will include customer interviews and the process will ensure that the true needs and wants of the customer are expressed.

1.5 Research Method

The research method for this study will involve identifying a target group of Mustang owners and through a one-on-one interview process to try to gain some knowledge into their perceived needs for the vehicle. The research will begin with the construction of an interview guide. The interview guide will serve as the agenda for the interviews and will ensure that the process is kept on target with the objective. The interviews will be set up in three parts. Part one of the interview will be to discuss images with the customers that they brought and how those images remind them of a Mustang. The goal of this part of the interview will be to get the customer thinking about the Mustang prior to the interview as a sort of preparation. The image discussion will also serve as a way to gain a broader perspective from the customer above and beyond traditional question and answer type methods. Part two of the interview will involve driving a current model year Mustang. Upon completion of the drive, the customer will be asked questions about that vehicle. The purpose of this part of the interview is to gain insight into the current needs of Mustang owners regarding the current model. The third part of the interview process will involve driving a competitor's vehicle. The competitor's vehicle will be used as a comparator against the Mustang. Upon completion of the competitor drive, the interviewee will be asked questions about the vehicle to try and gain additional insights into the needs and wants of the customer. The image discussion, Mustang drive and competitor drive will provide three perspectives to surface the needs and wants of Mustang customers.

Chapter 2

2.1 Marketing Research

Marketing research has many roles and benefits at all levels within an organization. The ability to gain insight into the minds of customers about their needs can be obtained through market research. The need to understand a current product or to try to define future products can also be done through the utilization of market research. Other uses for market research might be to improve a process or understand how a reduction in time can be implemented in a system. The techniques used in market research can vary from company to company, but understanding customer needs is one of the main goals of market research.

Market research helps to better define customer needs and allows companies to develop and design products that meet those customers' desires. *Churchill (1999)* suggests a sequence steps when designing a research project (See Figure 2.1). Problem Formulation is crucial to the entire process of market research. The ability to understand the problem to be solved can provide better results obtained from a research project. The method of problem solving begins with determining the objective of the project. The definition of the problem to be solved and understanding the objective of the project will provide valuable data from a research project. Designing how the research will be conducted is another important area in the research project. If little is known about the problem to be researched, the amount of exploratory research

will be greater than that of a problem that is known. The data collection method is another key step in conducting a market research study. The objective of the project has a considerable influence on the data collection method. The method of data collection and how questions are structured in

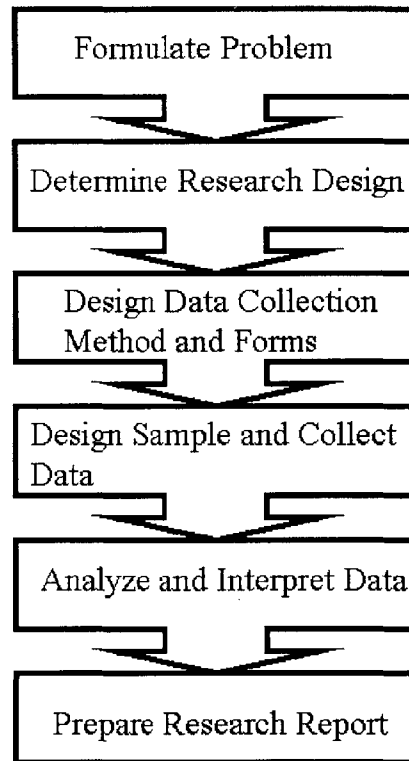


Figure 2.1 Relationship among the Stages in the Research Process adopted by Churchill (1999)

the research project are all types of issues that will determine the data collection method. Sample design is another important area in a research project. The things to consider in designing a sample would be to determine the size of the sample for the project, how the participants will be selected, their demographics and what framework will be used to collect data. After

completion of data collection, the analysis and interpretation of the data is done. The analysis and interpretation of data is one of the critical steps in the research process. The method by which it is accomplished can vary but the end result of the analysis is what provides insight into the problem the company is trying to solve. The report, another important area, is the final step in a research project. The report generated from the research findings provides the link from the market research phase to the organization through thoughtful conclusions.

2.2 Marketing's Link to the Customer

The importance of the customer within companies today has taken a larger role in the design of new products. The ability to understand customer needs and providing products that meet those needs is a top priority in today's industries. Customers' needs and wants dictate which product they will ultimately purchase. Companies realize that understanding their customers needs and wants can provide a competitive advantage, and the role of market research is to try to understand those needs and wants. In order to satisfy customer needs, companies must understand what drives customer decisions for the products they purchase. *Berkowitz (1994)* suggests that a market has four controllable factors. The four factors are known as *The Four P's*. The factors that control a market are *Product, Price, Promotion and Place*. The product is a good or service that will satisfy a customer need or perceived need. Price is the amount that the customer is willing to pay for a product or service.

The promotion of the product is the process that informs the potential customer of the product and its attributes. The location, where the customer can purchase the product, is known as the place. The four P's can also be integrated into a company's marketing department. The effect of the four P's on a market and customer's needs and wants can provide valuable feedback to organizations (See Figure 2.2). The market is the arena that makes up the

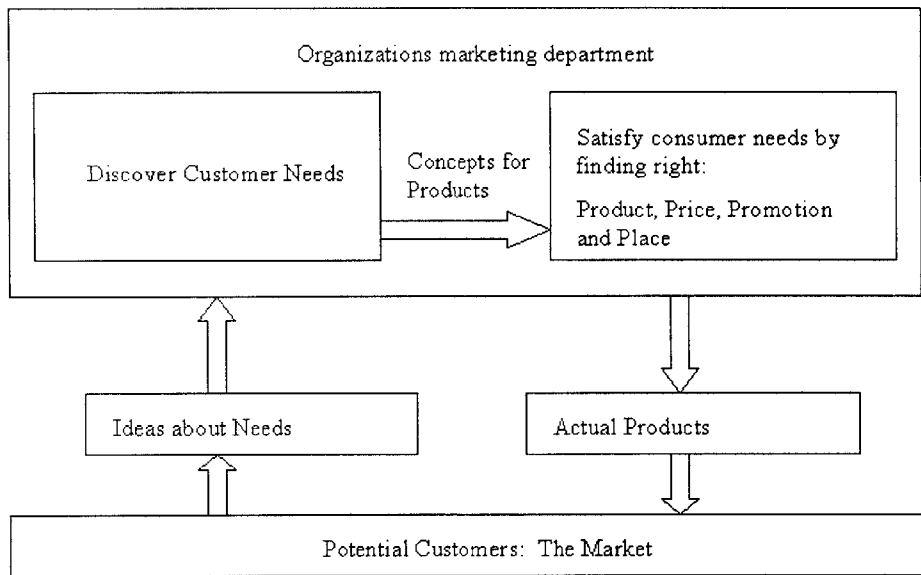


Figure 2.2. Marketing's second task: Satisfying consumer needs adopted from Berkowitz (1994)

customer base. The needs of those customers are fed back as ideas. The ideas are then identified to establish customer needs. The needs of the customers are then incorporated in products, with the four P's in mind to help in the connection with customers. The actual products are then put onto the market and the feedback cycle continues. The voice of the customer must be understood within a company's marketing organization to ensure that customer needs and wants are being met by their products.

2.3 Role of The Voice of the Customer

The customer voice has many roles in the development of new products. The voice of the customer can express an idea for a new product or an innovation for an existing product. An analysis of the voice of the customer can assist companies on ways to improve their products and in developing new products. A company's ability to effectively engage the customer voice allows them to learn more about what motivates customers to purchase a product or to better understand how a product is used. The voice of the customer can be a key link to understanding how a product is meeting the needs of its customers. The success of a product comes from the company's ability to understand and satisfy the needs of its customers.

2.4 Methods to Obtain the Voice of the Customer

The methods for obtaining the voice of the customer can be accomplished through many different techniques. The voice of the customer and the method used to gain their insight is dependent upon the objective and type of information needed from the customers. The objective of the research project, in many cases, will dictate the voice of the customer method that will provide the best results. Companies that are interested in obtaining meaningful feedback from a large group of customers in a single setting may decide on the focus group method. If specific data is desired on how customers rate a product, a company may use survey methods to gain insight. The one-on-one interview method is another technique that provides data from individual

customers to help gain insight into needs and wants of a product. The one-on-one interview technique can either target a specific set of customers to gain specific information, or it can be broader to gain a different view of customer needs. The method used to gain the voice of the customer and data obtained can provide valuable insight into the needs and wants of customers. In looking at some of the various methods to gain the voice of the customer, it can be seen that each has its own strengths and weaknesses.

2.4.1 Focus Groups

The focus group method of research involves a group of individuals brought together in a single setting to gain insight from the group as a whole. The focus group is typically comprised of one or more groups of individuals led by a moderator. The role of the moderator is to lead, direct and run group discussions to try and gain the necessary information toward meeting the objectives set fourth by the company. One of the ways a focus group setting can be beneficial is by targeting a particular segment of customers. If a company is looking for help in making a decision on whether to introduce a new feature in a product, a group of users of that product might be called in to evaluate the idea. The feedback from the group can provide good insight as to how a larger population is likely to react and will also give the company feedback on whether they should proceed with the idea. A focus group may also involve employees within a company. If a company is planning to introduce a new process in their organization they may want to gain initial

feedback before launching the process on a company-wide basis. An internal focus group, with key individuals from affected departments, may be brought together to gain insight on how they perceive the new process. The information gained from this internal group may be a good indicator of how the rest of the company will react. One of the main advantages of the focus group technique is it allows for a variety of perspectives to interact with each other in an open forum which, in many cases, allows for frank and constructive responses. The benefit of such open responses allows for additional customer voices above and beyond the objectives of the discussion. One of the main weaknesses of a focus group setting is that there may be one or more dominant individuals in the group who might influence the responses from the rest of the group. Overall, the focus group method can provide helpful insight into the voice of the customer.

2.4.2 Customer Surveys

The survey method of gaining the voice of the customer is constructed in such a way that a set of questions, in questionnaire form, is given to customers to gain feedback on how they might rank a product or service. The survey can be given to a target set of customers or randomly to gain a broader perspective. In many cases, the set of customers asked to participate in the survey will provide good representation of a larger population. The types of surveys and how they are administered vary. A survey might be conducted over the telephone, through the mail, via the Internet or face-to-face, talking with

customers in settings like a grocery store, department store or shopping mall. One of the main advantages of the survey method is that it can provide detailed information to companies about a product or service. For example, if a company is trying to improve a service in their organization, they might ask their customers to take a survey after their visit to identify the areas where they fell short of customer expectations. The survey method can also provide statistical data that can be put into chart form for review. The main disadvantages of the survey technique are that a large amount of non-responses might occur, or the data may be tainted if the questions are not clearly understood by the customers. The survey technique can provide valuable information to companies but its role and purpose tends to be more targeted than other methods.

2.4.3 Information Pump

In looking at the Information Pump, developed by Drazen Prelec, (Professor of Management Science, Sloan School of Management, Massachusetts Institute of Technology) the method develops incentives for collecting customer information. The information is relevant to the product design process and the incentives are put into a web-based information system for data collection. The incentive-based approach has advantages over traditional methods. Conducting an incentive-based approach, it allows for consistent motivation and effort on the part of the customer. The incentives also clearly communicate the information required from the customers. The

process allows the customer to monitor their progress when providing information, which can lead to improved responses over time. Finally, the incentives approach will identify the strongest customers from the group and they can be used for later studies. In the incentive-based method, two approaches might be used to create incentives with customers. The ability to link compensation to the outcome of the project might be one method; the second might be to compare the responses of two customers simultaneously. The Internet can provide the source to implement this type of setting. The Information Pump is a way to get customer information via the Web on a new product, and that information can be discussed among the customers through e-mail messages to each other. The main advantage to the Information Pump method is that it provides a scoring method for qualitative and quantitative information.

2.4.4 One-On-One Interviews

The method of one-on-one interviews is accomplished through an interviewer and an interviewee. In this type of setting, the company can get direct unfiltered feedback from customers. The questions posed to the interviewee are often of the open-ended type. The development of an interview guide assists the interviewer to ensure that questioning is kept on track with the objective of the research. Open-ended questions tend to allow the interviewee to take the lead in the discussion. The customer is asked to give his/her impression of a product or service to be used for later analysis. The

customer feedback may express a need, an area in which a product or service fell short of expectations, or even where the product exceeded expectations. The feedback from the customer can provide companies with valuable data to understand how their product fits in and is used in the lifestyle of the customer.

The one-on-one interview method can provide a wealth of information about a product. One of the key factors in the success of a one-on-one interview is to ensure that the objective of the interview is known and the questions are structured in such a way to meet that objective.

2.5 How Influences Change Customer Choices

The success and failure of a product is defined by its need and acceptance among customers. In this type of environment it is crucial that companies determine customer needs and meet those needs with their products. Understanding customer choice for a product and understanding how they make that choice is as important as understanding customer needs. *Simonson (1993)* suggests that customer preferences are often unclear and, in some cases, the choices they make can be biased through outside influences. Understanding the customer means not only documenting spoken needs, but it also means understanding the other factors that contribute to their decision process.

One of the things that can influence the selection of a product is the availability of alternatives. If a customer has only one product to choose from,

then other products would not influence the decision they make. If faced with multiple alternatives, the product with the greatest perceived value or utility would have a better chance of being chosen, even if priced higher. Understanding the evaluation of alternatives and putting the focus on a certain product can influence a customer to purchase a particular product. If the customer's attention is focused on a certain product displayed to attract attention, it can influence the purchase decision. The way that alternatives are described can influence a customer's decision, as well. The customer's perception of a product, based on how it is described, can lead them to choose one product over another. Another influence on customer choice can be the timing and quantity of products for the choice they make. A customer may be more likely to choose a product they may not have been considering if they perceive a future need for that product. The customer may also be unclear on exactly what options they want, so they may choose more than they planned, based on possible future need. The addition of features can influence customer choice if such features have little or no perceived value. If a product offers an additional feature, or includes an extra option if purchased, the customer may use this as a reason to not purchase it based on its perceived value. In looking at the voice of the customer, it is important to understand that customers make decisions based on many factors. A company that understands those factors can better identify the needs of its customers.

2.6 What Customers Don't Tell You Directly

The non-verbal responses from customers can provide valuable information about their needs and wants in a product. Observing the customer during an interview can provide insight into additional needs that are not being expressed verbally or would have not come out through asking questions alone. *Leonard and Rayport (1997)* contend that it is difficult to capture all customer needs through traditional market research alone, and through a technique called "Empathic Design" one can gain further insight into customer needs.

Observing customers using products and services in their own environment can provide valuable insight into additional customer needs for a product. In looking at the benefits of empathic design, one of the advantages is product usability. Is the product being used for the purpose intended? Customers may be using a product in a manner different from the way it was intended. Through observation, new uses for a product or ways to improve on its current design intent may be discovered. The environment in which the product is used can also provide valuable insight into customer needs. The customer may use a product in his or her own environment differently than they would elsewhere. The ability to observe a product's use in the customer's environment can help identify needs that may be unique to a particular customer. Another area that can identify additional customer needs through observation is how people modify a product to satisfy their needs. If a customer has to change the function of a product to optimize its use, can that need be captured and incorporated to improve overall performance? The

observation of customers using products may also bring out features that are a delight to the customer. Is a feature on a product being used for its true purpose or is it not being noticed? Customers may not be aware of, or are misusing, features in a product, and through observation, it can be seen that this might be the case. The method of observation can also highlight problems with a product that can be addressed through an improved design, but which would have never surfaced if it were not for watching the customer's use of the product. Traditional market research techniques can provide companies with valuable data for new products but with the addition of observation, further insight into the needs and wants of customers can be documented to help companies understand their customers better.

2.7 Research Method to Gain the Voice of the Customer for this Study

The method chosen to gain the voice of the customer for this project was the one-on-one interview method. In choosing this method, I felt that working with customers on an individual basis would provide the best data for my study. The objective was to gain an understanding of customer needs and wants for the Ford Mustang. In order to accomplish this task, the customer was given the opportunity to drive vehicles as part of the interview process. The majority of participants for the study were current Mustang owners. The use of current Mustang owners would provide the type of feedback needed to meet the objective of the project. In order to better utilize the time of the

interviewees and, since only one individual could drive the vehicle at a time, the one-on-one interview method would work best for this type of study.

2.8 Voice of the Customer Process and Steps

The research study required a number of steps to gain the voice of the customer. The process involved preparation, conducting interviews and analysis of the data. The customers selected for this research project were comprised of current Mustang owners and past Mustang owners. Interviewing Mustang owners would provide good comparative data to a competitor vehicle with respect to their Mustang. An interview guide was developed to serve as a guide for conducting the interviews. The interview guide would allow for consistency in the interviews and would prevent deviations from the objectives of the study. The interviews were conducted through picture evaluations and vehicle drives. The interviewees were asked a series of questions following each part of the interview. Upon completion of the interviews, customer voices were derived from the interviews. Customer voices constituted extracted phrases from the interviews that expressed a need or want of a customer. The next step was to take the customer voice and define a requirement. The requirements would then be linked to an affinity diagram for analysis. The following paragraphs discuss, in greater detail, the steps taken for gaining the voice of the customer for this research project.

2.8.1 Select Customers to be interviewed

The selection of individuals to be interviewed is one of the critical steps in a voice of the customer project. Individuals who provide valuable feedback about a product can assist companies in understating their needs. Ensuring that the right customers are selected can have a significant effect on the entire process of the project. *McQuarrie* (1998) suggests that there are three laws involved in the selection of potential respondents. In looking at the *first law*, it states, "garbage in, garbage out." The target customers should be selected in such a way that the data you receive will help in the success of the product. In order to ensure that the information received from this research would provide useful results, the customers selected had good knowledge of the product. The individuals who were selected to be part of the research either owned a Mustang or had good knowledge of the vehicle. I felt that this type of customer would be able to provide valuable information in the critical areas of the research. The *second law* indicates that having a large sample of customers is better than a small sample. The definition of a large sample indicates that data is generated from a wide range of customers, who can provide different perspectives. In many cases, if a small sample of customers is taken, they may have similar perspectives and some data may not be discovered. In this research, the customers who were selected differed in age, length of time of ownership, experience with their vehicle and range of use, which ensured responses were from several different perspectives. The *third law* indicates that there is a point at which the data reaches its maximum potential. At some

point during the research, data will begin to become repetitive, or not provide any new information that will contribute to the objective. I felt that six interviews would produce the results, responses, and data needed, and would begin to become repetitive if additional interviews were conducted. The selection of customers for interviews is critical to the success of the project. The careful selection of the right customers can provide valuable data and, ultimately, lead to a successful understanding of customers needs.

2.8.2 Preparation of Interview Guide

In order to ensure that all the critical areas of the study were addressed, an interview guide was prepared. The purpose of the interview guide is to serve as an agenda for the interview. In conducting the interviews for the project, I wanted to be certain that the information gained was in line with the objectives of the study. The preparation of the interview guide ensured consistency and minimized variability during the interviews. The interview guide proved to be an excellent way to keep on-track during the interviews. The questions contained in the interview guide were open-ended, so that the interviewee would not feel there were right or wrong answers for their responses. The openness the interview allowed free expression in answering the questions. The questions were structured to: 1. Understand customers' uses of their vehicles, 2. Understand how the Mustang fits into their lifestyle, 3. Understand current needs and wants, 4. Understand future needs and wants, 5. Prioritize and gain an understanding of the attributes of the vehicle that are key with the

customer, and 6. Understand how a competitor's vehicle performed, in their opinion.

The primary objective of the interview questions were to gain a full understanding of the owner/vehicle relationship, prioritize customer voice and gain insight into customer needs for their vehicle. It should be noted that the interview guide was only a form to reference; each interview had its unique aspects that were built upon during the interviews. Another purpose of the interview guide was to provide a framework for the three main areas of the interview.

The *first part* of the interview guide focused on a picture discussion with the interviewee*. The structure of the questions in this part of the interview focused on reasons why the interviewee selected a particular picture and how it related to a Mustang. The goal was to understand the feelings the image elicited about their Mustang, and the responses could be used as building blocks for later questioning. The *second part* of the interview guide was setup to understand and obtain data from customers about their Mustang. The questions structured so as to understand the total experience with their vehicles*. The focus was centered on the experience before they owned a Mustang, while they owned a Mustang, and what the ultimate Mustang would be like if they could design such a vehicle. The goal in this part of the interview was to better understand how the customer relates to their vehicle. The *third part* of the interview guide contained questions to help gain an understanding

of how customers felt about a competitor's product*. The questions in this part of the interview guide were structured to gain an understanding of impressions of how the competitor's vehicle was perceived versus how it actually performed. The goal of this part of the interview was to understand how well the impressions of a vehicle correlated to an actual vehicle. The questions were also used to gain an understanding of areas in which the competitor's vehicle had differences with the Mustang. The interview guide was one of the main tools that provided the driving force between the objectives of the research project and the outcome of the data.

* Topic will be discussed in more detail later in paper

2.8.3 Conduct Interviews

The interviews were conducted in three parts: Part one involved a picture discussion; part two involved driving/discussing the Mustang; and the third part involved driving/discussing a competitor's vehicle. The time allotted for each interview was 60 minutes. The picture discussion, Mustang GT drive/discussion and the competitor's vehicle's drive/discussion were each allotted 20 minutes. The first part of the interview was designed to allow the interviewee to express thoughts about a Mustang through images brought to the interview prior to interacting with the vehicle. In the second part of the interview, the interviewee drove a Mustang GT and answered questions about the vehicle. The purpose of driving the vehicle prior to asking questions was to allow the interviewee an opportunity to recall feelings about their Mustang. In

the last part of the interview, the interviewee drove the competitor's vehicle and answered questions about that vehicle. The general approach of the interview was to get unbiased feedback first from the picture discussion, get feedback about the Mustang, and then get feedback about the competitor vehicle. The role of the competitor part of the interview was to investigate areas that were better, worse or the same, when compared to the Mustang.

2.8.3.1 Picture Evaluation

In the first step, the interviewees were each asked to bring to the interview five to seven images that reminded them of a Mustang. They were asked to use sources of their choice to obtain the pictures. Many of the pictures came from newspapers, magazines, photos and the Internet. The image collection allowed the interviewee to prepare for the interview and, by collecting images that reminded them of a Mustang, ideas would get started prior to the interview. The image discussion was designed to take the interviewee out of the realm of the traditional question and answer format. The pictures would be used to gain a deeper understanding of customer needs by linking the images in the pictures to the Mustang. The image discussion also elicited some non-verbal responses from the interviewees. The facial expressions and body language used while they were describing the image also provided valuable insights. The gathering of pictures or images prior to the interview enhanced the responses during the interview. The interviewees were asked why they brought each picture and how it reminded them of a Mustang.

The picture evaluation allowed the interviewees the opportunity to have an open forum to discuss items about the Mustang. In looking at the traditional types of voice of the customer methods, such as focus groups or surveys, such methods appear to have a tendency to bias the interviewee with targeted questions. Allowing the interviewee to speak freely by discussing images allowed for more non-traditional responses that may not have arisen from traditional methods.

2.8.3.2 Mustang GT Drive

The next part of the interview involved driving the Mustang GT. The interviewees were asked questions about the vehicle upon completion of the drive. The questions were structured in such way to gain an understanding of the total experience the interviewees have had with their Mustang. The questioning was divided into four basic areas. The first area focused around gaining an understanding of the current Mustang owned by the interviewee. The purpose of this line of questioning was to gain knowledge into the type of vehicle the interviewee owned. Several questions focused around areas relating to how the vehicle fit into their lifestyle and some of the attributes that were important to them in their vehicle. The second area of questioning focused around the expectations the interviewee had prior to the ownership of their vehicle. The goal in this part of the interview was to gain an understanding of the expectations a potential Mustang customer may have prior to ownership. In the next area, the questions were intended to get a sense of the feelings they

experience when driving their Mustang. The objective here was to understand how a customer's expectations compare with the actual vehicle. The final area of the interview focused on the characteristics a Mustang must possess to define the ultimate Mustang in their minds. The goal was to better understand the key attributes of a Mustang as described by the customers and understand what things they would want if they could design the vehicle. The Mustang drive and discussion part of the interview focused around gaining insight into the Mustang owners' needs and wants relative to their vehicle.

2.8.3.3 Competitor Vehicle Drive

Upon completion of the Mustang portion of the interview, the next area was to drive the competitor's vehicle. The purpose of this part of the interview was to allow the interviewee the opportunity to drive a competitive vehicle and gain insight into the performance and feel of that vehicle. The goal of this part of the interview was to allow the interviewee the opportunity to compare attributes vis-à-vis the Mustang. The feedback from the customer would provide valuable insight into areas they liked and disliked about the vehicle. Once identified, the information could be analyzed to understand the attributes from the competitor vehicle that the Mustang owner liked or disliked. In this part of the interview the questions were structured in three basic areas. The first area focused on their overall impression of the vehicle. The objective in this part of the questioning was to gain some understanding of the vehicle brand and what feelings the interviewee equated with the vehicle. The second

area focused on the driving experience and key attributes of the competitor's vehicle. The goal in this part of the interview was to understand the strengths and weaknesses of the vehicle. The last area focused on getting an idea of how the vehicle differed from the Mustang, both in positive and negative ways. The goal here was to understand how the two vehicles compared to one another. The interviewee had an opportunity to drive both the Mustang and the competitor's vehicle and could compare the two vehicles. The competitor vehicle portion of the interview allowed for the interviewee to make a direct comparison between the two vehicles. The end result was that the interviewee was able to provide valuable feedback on both the Mustang and the competitor's vehicle to discuss likes, dislikes, needs and wants for both vehicles.

2.8.4 Identify Customer Voices

After completing the interviews, the customer voices were transcribed to help identify key customer voices. The key customer voices expressed key issues, concerns, problems, needs or information into solutions from the questions asked during the interview. In looking for key customer voices from the interviews, the goal was not to identify requirements but to identify voices that would lead to customer requirements for the Mustang. The objective was to find voices that expressed a need, want, problem, concern or even a solution to issues expressed by the interviewees. The voices taken from the interviews

were specific to an issue and would later help in identifying customer requirements.

2.8.5 Scrubbing of Voices to identify Customer Requirements

Once the key customer voices were identified, the next step was to translate those voices into customer requirements. The ability to understand what the customers are expressing with their voices helps in constructing meaningful requirements. The requirement statements will be used to help in understanding the actions necessary to assist in satisfying a customer need. The requirement statements were constructed to identify a requirement voiced by the customer; not a solution. The requirements from the customer voices would later be used to identify a solution. In order to ensure that the requirement expressed the true meaning from the customer voice, key ideas from each voice were recorded, in addition to their statement. In combination with the key ideas and the original voice, a requirement was developed, which expressed the voice of the customer. The identification of the customers' voices from the interviews resulted in 22 requirements. The requirements would be used as the basis for analysis and would be linked through an Affinity Diagram.

2.8.6 Linking Requirements through an Affinity Diagram

The customer requirements, in this step, were prioritized, linked and grouped into an affinity diagram for further analysis. The requirements were

first grouped into level-one groupings. The level-one groupings contained similar ideas and were placed together to create a common theme from the customer voices. The 22 requirements from the research resulted in 11 level-one groupings. The level-one groupings were then given level-one titles. The goal of the level-one titles was to capture the main theme expressed in the level-one groupings. The titles of the level-one grouping were specific in nature to capture the true meaning of the customer voice at a higher level of abstraction. Once the level-one groupings were complete, the next step was to create level-two groupings. The level-two groupings further built on the level-one titles through linking similar themes together. The results from the level-two grouping created four groups at the level-two stage. The next step was to create level-two titles, which provided insight toward the objective of the project.

The goal of grouping requirements through the various stages was to begin to move up the ladder of abstraction to ultimately find high-level groupings for each of the requirements. The high-level titles will be the link between the customer and the product that expresses their voice. The grouping was put into an affinity diagram, which provided the basis for the analysis of the research from the customer interviews. The next chapter provides an in-depth analysis of the results from the affinity diagram.

Chapter 3

3.1 Introduction

In this chapter, the analysis of the Affinity Diagram will be discussed. The affinity diagram provides a structure in which the customer requirements are linked by common themes for analysis. As you move up the ladder of abstraction in the affinity diagram, a better understanding of the customer requirements is expressed. The expression of those customer requirements, through analysis, can provide valuable feedback regarding the needs of customers. In this chapter, the affinity diagram was grouped into four level-two groupings. Each one of those grouping will be discussed, and ideas from the voices of the customers will be analyzed, to further understand their needs.

3.2 Qualitative Analysis of Customer Voices

In looking at the voices from the Mustang study, it was shown that four distinct areas were of high importance to customers. In looking at the affinity diagram, the level-two groupings were placed into four main categories. The categories were:

- Group 1 Vehicle Roots
- Group 2 Performance and Expectations at All Levels
- Group 3 Image, Personality and Heritage
- Group 4 Driving Experience

The four groupings illustrate the highest level of abstraction in the affinity diagram. The level two, level one and customer voices will be discussed further in the next sections.

3.3 Vehicle Roots

The first level-two grouping, called "Vehicle Roots," defines the attributes of the vehicle that customers feel are important to help define the vehicle's character. The character of the vehicle can be defined as those areas that are seen and heard in a Mustang. The three main groups under vehicle roots are: 1. Styling and Delights; 2. Quality and Craftsmanship; and 3. Vehicle Definition (See Figure 3.1). The area of styling and delights focuses on the design of the Mustang and the features within the Mustang. Quality and craftsmanship addresses the areas of the vehicle that customers equate with quality and how the various parts of the vehicle are linked with customers. The vehicle definition group defines how the vehicle sound helps define its roots with customers. In the following, sections each customer requirement will be discussed to help in defining the voice of the customer.

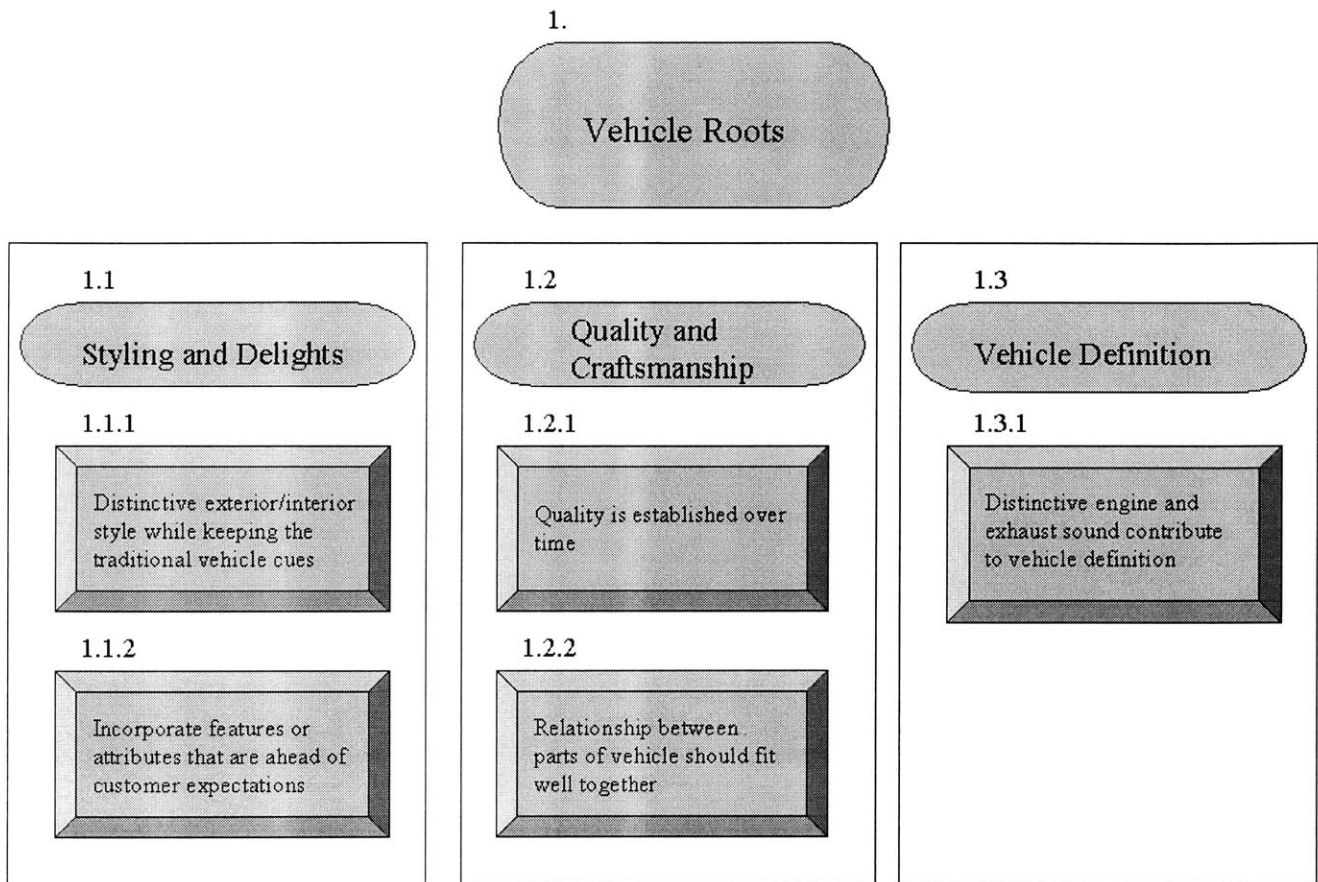


Figure 3.1 Group One “Vehicle Roots”

Distinctive Exterior/Interior Style while keeping the Traditional Vehicle Cues

Vehicle styling was one of the areas that customers felt strongly about with respect to the Mustang. The styling of the vehicle goes beyond the exterior body panels of the vehicle. Styling is important in all areas of the vehicle and needs to be incorporated in both the interior and the exterior of the vehicle. One of the key voices from customers was in the area of leading-edge designs. Leading-edge designs were defined as the incorporation of a style that is

current with today's ideas and also incorporates future ideas ahead of current designs. The customer wants to see current designs that are in step with the competition, but the vehicle must also incorporate leading-edge design elements to remain ahead of the competition. The area of traditional styling cues was also an important part of vehicle styling. The base designs that have been part of the vehicle since its inception must be maintained through out its life cycle. The styling must hold some of the styling cues of past models. In particular, the styling cues that brought the vehicle to what it is today were its long hood, short deck, side/hood scoops and large wheels. Being able to keep in the forefront of style while maintaining some of the traditional cues is a fine balance that is important and must be in the design of the vehicle both now and in the future.

"It should just look fast sitting there"

"It has a style that appeals to me, especially on the interior, which is something that some of the competitors, I think don't have"

"The styling of the Mustang must be leading edge, with a remembrance of the early Mustang but with a new style"

"Styling is very important, it has to have unique styling"

Incorporate Features or Attributes that are Ahead of Customer Expectations

The features or attributes of a product that are not expected by the customer can be classified as “Surprise and Delights.” It is very difficult to anticipate future wants of customers, but the ability of a company to have insight in this area can put their products ahead of competition. One example is the advent of cup holders in vehicles. In past vehicles, before cup holders, the customer did not have an awareness of the feature that is now standard on nearly all vehicles sold today. In this case, the customer did not realize the need for cup holders until it was introduced and now they are expected. Another area of surprise and delights is when the customer doesn’t directly see the benefit. An example in this area is in the effort required to exit a vehicle. The critical areas include the ergonomic layout of the door handle, the effort required to open or close the door, the effort required to ensure that the door is closed properly, and weight of the door. The customer may not notice the effort required to exit a vehicle if it is not difficult to do so, but they will notice, and may be dissatisfied, if difficulties are present. In the research, the surprise and delight items centered around features that were seen by the customers on the vehicle. One of the examples was in the window-operating switch on the competitor’s vehicle, which has the ability to lower all four windows with the touch of one button. The Mustang customers did not know of this option and expressed a desire for it once they became aware of its availability. The ability to capture both direct and indirect types of surprise and delights will prove to be an advantage for a product.

“One thing that I always wished my Mustang had was one button that would pull all four window down”

“In fact, I was presently surprised at some of the things that were standard on it (Mustang), like a CD player”

“I like the controls on the steering wheel”

“It was nice and it had a lot of great little features”

Quality is Established Over Time

Quality can be defined in many ways and it's critical to understand that quality in the eyes of the customer for this study focused around all areas of the vehicle. One of the obvious measurements of quality in vehicles is the longevity of its performance without problems arising. The research showed that Mustang owners typically bought their vehicles to own because of their desire to keep the vehicle for a long period of time. Mustang customers are unique because they will drive their vehicle for many years and they expect a problem-free experience for the life of the vehicle. The issue of quality, therefore, becomes even more critical in the eyes of Mustang customers. Quality problems are seen at all levels in the eyes of the customers. The smallest areas, such as a bulb burning out on a taillight, or something on a larger scale, such as a transmission failure, are important to customers. Quality is also found in the functionality of systems on the vehicle. As an example, the functioning of a convertible top and the effort required to operate it, are measures of quality among customers. Another area that was linked to

quality was in types of plastic utilized in the interior of the vehicle. The feel, texture and appearance of the interior plastic were also measures of quality. The ability to understand that quality has many forms in the eyes of customers is critical to the success of a product. Quality within a vehicle is a reflection of the total vehicle, and not only the breakdown of functional parts.

“The quality of being strong is not made in a gym”

“The quality of the plastic is poor”

“I want to be able to have a car for a long period of time”

“It exceeded my expectations in terms of quality”

Relationship between Parts of the Vehicle should fit well together

The fit, function and craftsmanship of a vehicle are also important among customers. The relationship between these areas is viewed at all levels of the vehicle. In looking at the interior of the vehicle, a critical area we found was with the instrument panel. The instrument panel was viewed as a single entity and customers took all of its fit and function into consideration. On the outside of the vehicle, the critical areas seem to focus around the fit of the body panels with each other. The relationship between parts is important to the customer and, even if they are a combination of numerous parts, they should fit together as though they were one. The deletion of features was another area of importance to customers. Customers have an awareness of features that are standard on a vehicle. In the early years, a new vehicle may be equipped with

features that become an integral part of the vehicle. When those features are gradually removed over time, it becomes a dissatisfier with customers. In looking at the area of craftsmanship, customers seem to deem it to be an advantage if attention to detail is noticeable in the design. The initial designs of the product are critical in the eyes of the customer. The customer does not want to have the feeling that something on the product was an afterthought. The product's attention to detail and design up-front are important to customers. Understanding the customers' perception of how parts of the vehicle are viewed and designing the right product up-front will prove to be a competitive advantage.

"It's quiet, good performance and very well refined. A lot of attention to detail"

"A lot of things seem to be second thoughts"

"I like the attention to detail, the fit and finish"

Distinctive Engine and Exhaust Sound Contribute to Vehicle Definition

Vehicle noise is another area that was important to customers and helped define the vehicle's roots. In this case we are talking about what I call "Good Noise." The term good noise, in this context, means the noise emitted by the vehicle through its exhaust. The Mustang has developed a unique exhaust sound that customers relate to when driving the vehicle. Customers want to preserve that unique sound now and in the future with the Mustang. The

unique sound when you hit the accelerator is something that has become expected with customers. Understanding the differences between expected customer attributes that customers want in a vehicle can lead to a more successful product.

“The performance is when you step on the accelerator and you hear the growl from the exhaust”

“Sometimes I run without the radio on just to hear the vehicle”

“The engine noise, the exhaust noise, that represents a Mustang to me”

3.4 Performance at all Levels

The second category, called "Performance and Expectations at all levels," encompassed the areas that customers felt were important with regard to vehicle performance. Performance and customer expectations are seen at all levels in the vehicle. In trying to understand the performance at all levels, the research showed the areas of high importance to customer as being; 1. Expectations; 2. Vehicle Systems; 3. Fuel Economy; and 4. Performance (See Figure 3.2). The area of expectations included how the customer needs met actual performance. The area of vehicle systems focused around how the performance of the vehicle linked together. The discussion of fuel economy revealed that it is important to customers in all models. The area of performance focused on non-traditional areas that fit into performance in the eyes of customers.

2.

Performance at all Levels

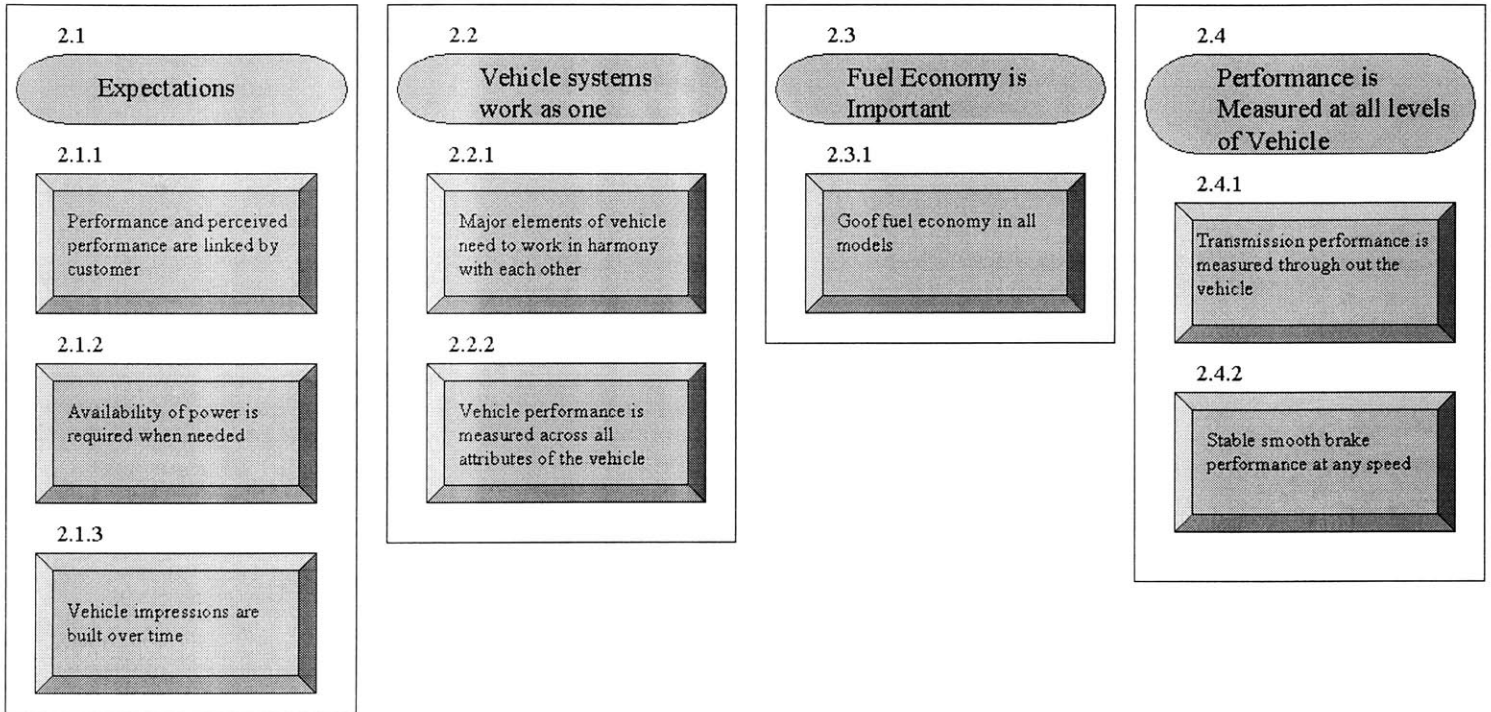


Figure 3.2 Group Two “Performance at all Levels”

Performance and Perceived Performance are linked by Customer

The performance of a vehicle and the ability to utilize that performance was of considerable importance to the customer. The customer has certain expectations of the vehicle and, when those expectations are needed, they must perform. In this research, one of the things the customer expects to have is the ability to count on power to the rear wheels whenever it is needed. Customers may not always need that power but, when called upon, the vehicle must perform. Acceleration was another area that was deemed critical to customers.

The ability of the vehicle to accelerate on demand in any condition was critical to customers. The relationship between the accelerator pedal and the response of the vehicle was also something that customers expect from a Mustang. Hitting of the accelerator has a certain expectation to customers. The vehicle needs to deliver exactly what is projected in its name when called upon.

"Just the adrenaline building up as you're waiting for the light to change and put it to the floor"

"I like to see smoke from the rear tires on a burnout and a high power start"

"The Mustang must have the ability to spin the tires"

Availability of Power is required when you need it

One of the key attributes of a Mustang is its power from the engine delivered to the rear axle. The Mustang customer expects that the vehicle will produce the power and torque that is required by them when needed. The power may not always be required under normal driving conditions but it is expected to be available when called upon. The power of the Mustang was equated mainly to the eight-cylinder engine among customers. The expectations of the engine are that it will provide good power and torque when needed. The Mustang has power in its name, and being able to meet the needs of customers with respect to power, provides an advantage.

"It should always make horsepower available for those who need it"

"The car has got to make good power and torque"

"You know, just go fast"

"The six-cylinder has impressive torque"

Vehicle Impressions are Built Over Time

The reputation and impressions we have of a vehicle is not something that is developed in a day but is built over time. The association a customer has with a vehicle is something that is developed over a period of years with the product. As customers become more knowledgeable about a vehicle, they expect that certain attributes will always be associated with that vehicle. In this research, certain impressions were associated with the Mustang. Customers viewed the Mustang as having a good reputation and as a powerful performer. The customer is able to associate the Mustang as a good performance vehicle, due to its long and favorable reputation. The impressions of customers must be kept constant in the vehicle through each model year but caution must be taken not to jeopardize those impressions. The customer has certain impressions of a vehicle and, if those impressions can be met or exceeded, then the product will maintain or gain an advantage over its competition.

"I was more impressed than anything"

"They just do everything right"

"I don't think it fell short of my expectations, it was impressive"

Major Elements of Vehicle need to work in Harmony with Driver

The relationship between the vehicle and the driver is important to customers. The driver, steering, suspension, braking, transmission and powertrain must work together to provide a harmonious experience to the customer. The customers felt that when they drive a vehicle, all systems should work as one; not as separate entities. One of the ways customers described this was the feel of the steering wheel on the road. The ability to feel the road and have control over any road surface was considered a satisfier among customers. Another area that was important was the vehicles on-center feel. The vehicle should have the ability to have solid, on-center feel, while being stable in its performance. The braking system should feel natural to the driver in all conditions. This is another example of being harmonious. The customer wants of all the attributes of the vehicle to work as one when driving under various conditions. The ability to understand that a feeling with the vehicle is something that customers deem important provides an advantage.

"When I drive a Mustang, I think of me and the car as being one machine"

"I like the feeling of the steering wheel to the road"

"When I drive a Mustang, I feel like I am one with the vehicle and we are in harmony"

"I mean you have to feel like you are in a cockpit"

"The vehicle can be described in one word, smooth. In acceleration, body and suspension work well together"

Vehicle Performance is measured Across all Attributes of the Vehicle

The word performance and its relation to a vehicle are commonly thought of as the performance of the powertrain. The customer, in many cases, thinks of engine power as only one of numerous attributes of performance. Some of the other areas that fell under the category of performance with customers were:

- Handling
- Braking
- Transmission
- Acceleration
- Power and Torque

Customers felt that all areas contributed to the performance of the vehicle. The dynamics of performance from the research showed that engine power is only one area of many that is considered by the customer.

"Performance in a Mustang is defined by power first, handling second and braking third"

"The vehicle accelerates smoothly and predictably"

"The Mustang has to remain a sports car with torque and good performance feel"

Good Fuel Economy in all Models

The area of fuel economy was important to customers. In the line up for Mustang, customers expect the vehicles to have good fuel economy in all models. The base Mustang vs. the GT Mustang will have varying fuel economy but the averages should be good for each powertrain. Fuel economy is a factor of performance in the eyes of the customer and being able to provide good fuel economy in all models provides a competitive advantage.

"Fuel economy is amazingly good"

Transmission Performance is measured throughout the Entire System

Each customer measured the category of transmission performance differently. The transmission, in the eyes of customer, is one part of the vehicle and should perform as one system with the rest of the vehicle. One of the most frequent responses made by customers when discussing factors that are of high importance to the performance of a vehicle, related to transmission performance. A vehicle with "smoothness" as described by the customer was directly related to the transmission. The term smoothness meant clutch effort, ease of shifting and transition thorough the gears, with customers. The transmission, if it performed well in the eyes of the customer, led to a

perception of stronger overall improvement in performance of the vehicle. Transmission performance is something that the customer feels is important when working as a system with high performance; it proves to be an advantage.

" The easy clutch effort, the shifter is very positive, very smooth, the free revving of the engine, everything just feels nice"

"It is more refined performance"

"The shifting and the clutch would be what I would recommend for improvement"

Stable Smooth Brake Performance at any Speed

Brake performance was another measure of vehicle performance. It is very easy to think of performance in terms of acceleration, cornering and handling, but braking is of equal importance in the eyes of customers. The vehicle, with every acceleration, will require a deceleration and the area braking performance is considered important among customers who expect high performance in the braking system. One of the key concerns is consistency of the braking system at all speeds. The vehicle, whether going 15 miles per hour, 70 miles per hour, the customer expects the same performance from the braking system. The performance of the brakes is also important with respect to different driving conditions. The customer expects the braking system to perform consistently whether in a turn, on a straightaway, through different

weather conditions or on a rough road surface. The braking system is an area in which the customer relates its performance to overall vehicle performance.

"The braking is good and that enters into performance"

"Good brakes are as much fun as good performance"

"Just braking alone, you can drive the car very hard and the car is very stable"

3.5 Image, Personality and Heritage

The third category, "Image, Personality and Heritage," focuses on the Mustang's past, present and future. The Mustang, over the past 35+ years, has become one of the classic American automobiles. The vehicle, through the years, has developed an image, personality and heritage among its owners. The name Mustang elicits an image among its customers and that image is an important part of the vehicle. In looking at the Mustang's proud past and its potential future, the two main groups in the third category are: 1. Image and Personality; and 2. Heritage (See Figure 3.3). The area of image and personality discussed how customers feel about the parts of the vehicle that maintain its current image. The area of heritage will explain how the Mustang has evolved over the years and what describes its heritage in the eyes of its customers. The Mustang has a proud past, an exciting future and, by understanding how customers view the vehicle, can provide advantages to meeting customer needs.

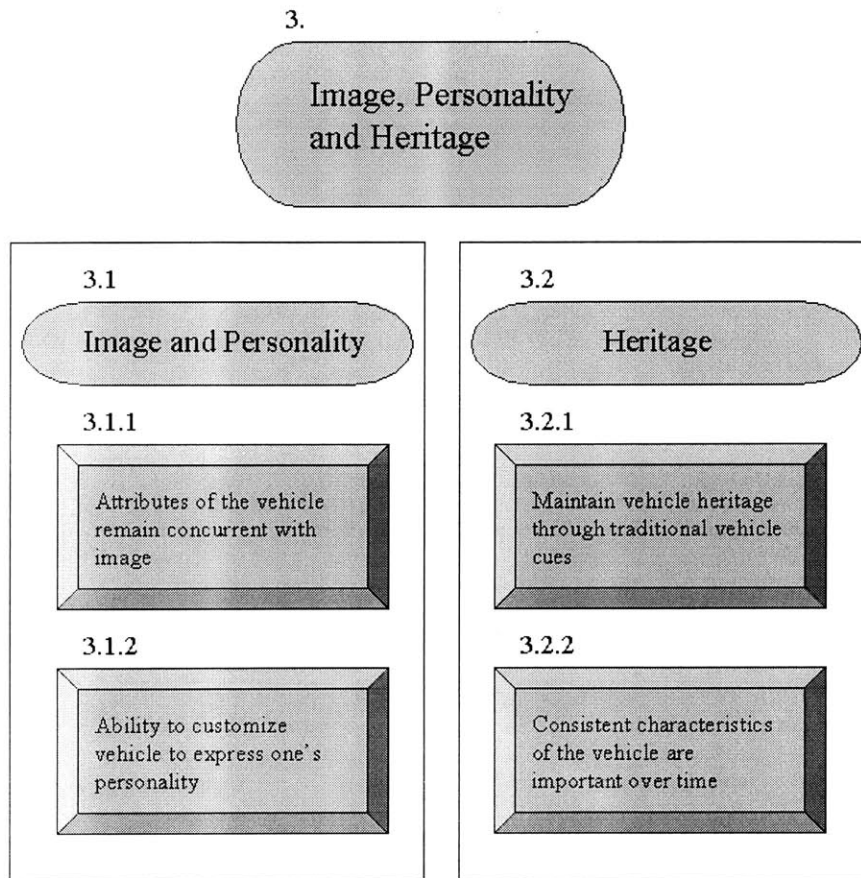


Figure 3.3 Group Three “Image Personality and Heritage”

Attributes of the Vehicle Remain Concurrent with Image

The image of a Mustang and customer association with that image were linked. Each customer had his/her own view of the image of the Mustang, but that image provided a link with the vehicle in his or her lifestyle. The images that were associated with the Mustang were:

- Sporty
- American
- Cool

- Convertible
- Sexy
- V-8s, powerful, fast

The image of the Mustang is defined in many ways among its customers, but being able to link that description with the vehicle is important. The ability to provide a product that will project multiple images, and linking those images to its customers, can help in the success of the product.

"The overall image of the Mustang is powerful, fast, high-performance, sexy, stylish, cool and American"

"Long hood, short deck, coupes and convertibles"

"It should have two doors"

"The attributes of a vehicle that define a Mustang is its image of being cool, sleek and sporty"

V-8s, fast and powerful, that embodies what Mustangs are and really sets the image"

Ability to Customize Vehicle to Express One's Personality

Customization was another important area among customers. In many cases, the ability to customize the vehicle should always be available. The vehicle purchase from a dealer is only the beginning for some customers with regard to vehicle ownership. The customization of their vehicle is something they feel helps make their vehicle unique from others on the road. The

uniqueness of the vehicle allows the customer to express who they are and what the vehicle means to them. The customers ranged from recreational drivers to people who raced their vehicles, and being able to customize their vehicle was important in all their responses. The range of customization ranged from simple cosmetic changes, such as different wheels, to changes to the engine/suspension of the vehicle. Each individual had his own reason for the customization that was done on their vehicle and, in the end, it helped define their personality. The ability to customize the vehicle is important to customers and can provide competitive advantages.

"You want to personalize it, so it says who you are"

"The people I know and associate with, all customize their cars"

I've customized my Mustang and that's important, you don't want it to be the average everyday car that everyone sees on the road"

Maintain Vehicle Heritage through Traditional Vehicle Cues

Mustang's heritage started back in 1964 when it was first introduced to the public. Over the years, customers have been able to relate to that heritage through unique aspects that have remained with the vehicle, even in today's model. Since its inception, the Mustang has possessed characteristics that customers have come to expect. The Mustang is referred to as a *"timeless classic."* What defines the Mustang as a timeless classic? Mustang's traditional styling cues were what made it a timeless classic among customers

from the horse on the grill, to the hood and side scoops, to the short aggressive powerful look, all are associated with the heritage of the vehicle. The traditional styling cues of the vehicle also bring out other aspects of the vehicle with customers. The Mustang heritage also creates a sense that the vehicle is an American icon, powerful, and a classic. The Mustang heritage is strong among customers and, continuing with traditional cues, the vehicle continues to build on its strong past as it moves toward the future.

"The Mustang has a suggestion of power in its roots"

"I think the Mustang, even when it first came out, had a classic timeless style to them"

"It should always have a horse"

"They want the image of a Mustang and want to be part of the heritage"

Everybody knows what a Mustang is, looks like, feels like and handles like"

Consistent Characteristics are Important Over Time

The association with the Mustang brand has been established through the timeless characteristics of the vehicle. The strength of the brand in a product is developed over time. The ability to maintain that strength in a brand must be a constant process. In looking at the Mustang brand, customers associated a feeling of strength with the vehicle. Another area that can enhance the brand is its reputation. Customers relate to the brand of a

vehicle, in some cases, based on the reputation of the vehicle. The ability of a company to keep a strong brand image and reputation with a product is a competitive advantage over other products.

"I always wanted to own a Mustang and foremost identified with the brand"

"The brand name for the Mustang is very strong"

"Well, it certainly has a good reputation"

3.6 Driving Experience

The fourth category, called "Driving Experience," is related to the feeling of driving a Mustang. The driving experience of a Mustang is important to its customers. The "Fun to Drive" experience is a high customer want from the vehicle, and the ability to understand how customers define it can be difficult, in most cases. The two main groups that encompass driving experience are: 1. Affordability and youth appeal; and 2. Relationship with the vehicle (See Figure 3.4). The Mustang projects are images of youth appeal and affordability. The success of the Mustang, in part, can be attributed to its ability to attract new customers. The Mustang's ability to attract new customers and be able to create a relationship with its owners is important and can enhance the driving experience.

4.

Driving Experience

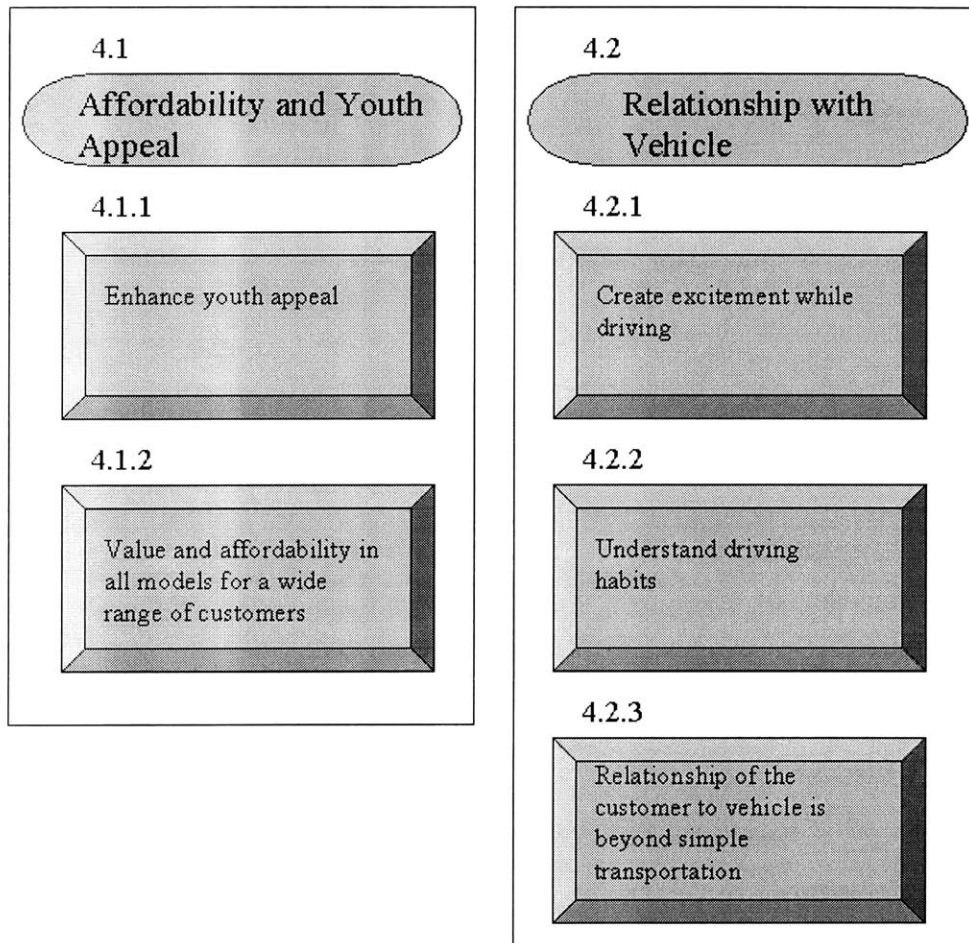


Figure 3.4 Group Four “Driving Experience”

Enhance Youth Appeal

The youth appeal of the Mustang was an important attribute among customers, and is brought out at all ages. The first-time owner and the repeat owner indicated that the vehicle brought out a sense of youthfulness. The Mustang's sporty appearance has attracted drivers of all ages from all parts of

the world. The vehicle's ability to recall childhoods, attract attention, project a free spirit attitude and bring out the youth in its customers is important in the vehicle. One thing that was consistent throughout the research is that the vehicle creates new memories as well as recalling memories from the past. The current youth appeal is strong, but the vehicle needs to continue that youthful feeling in future models, as well.

"The image of the Mustang in one word is youthful"

"It's sporty, it's convertible and it has a lot of youth appeal"

"I haven't had this type of enjoyment since I was a child"

"The car is something I always wanted as a kid"

"People are attracted to the car because it gives them a sense of youth and freedom"

"When I am in my Mustang, I feel like I am reliving my childhood"

Value and Affordability in all Models for a Wide Range of Customers

Affordability and value are other areas that customers deemed important for the Mustang. The terms "affordability" and "value" from the research meant slightly different things to customers. In the affordability category, the focus centered around having a car that was within reach of entry-level buyers. The hope was when customers have an option for an entry-level model, that for their next purchase, they will step into one of the higher end models. The Mustang has the potential of building life-long customers through its various

model offerings. In the area of value, two main issues were discussed. The first was in the area of features. In some cases customers equated features with value. A vehicle with limited features or features that were extra and not standard affected their perception of value. The other area of value was in the attention to detail. Customers felt that a vehicle that paid attention to detail and didn't look second-hand felt that there was value in the vehicle. The value and affordability in a vehicle can have different meanings, but companies need to understand what the customer perceives as affordable and as good value to ensure that the vehicle delivers.

"The expectation is that it would be affordable and have enough features on it and would be a lot of fun to drive"

"I think there should always be a model that is affordable to the younger buyer"

"For the money you are spending it should be a bit more refined"

"I can remember that it was a great value for the money"

"That's why I buy them, its for the value"

Create Excitement while driving

Excitement in a vehicle can come from many areas. In looking at the responses from customers, the main theme that created excitement for them was a vehicle that is "Fun to Drive." In trying to define the meaning of fun to drive, customers had different views. The fun to drive feeling for some

customers came through the performance of the vehicle. Other customers equated fun to drive with attracting attention in the vehicle and the enjoyment of cruising with others. Creating excitement in a vehicle is difficult and knowing your customer can help in that effort.

"The Mustang is fun to drive through its handling, steering, braking and performance feel"

"The Mustang must be fun to drive"

"I expected the car to be fun to drive, I expected to get a lot of looks from a lot of people while I was driving it"

"Part of what makes the Mustang fun to drive is to be seen, It's fun to be able to enjoy it with other people"

Understand All Driving Habits

In looking at a performance car, it can be easy to think that all customers want from a vehicle is good power, handling and braking. We must also consider the other customer uses for a product. In looking at the Mustang, there were customers who enjoyed other aspects of the vehicle outside of the traditional performance attributes. Customers, in some cases, felt the vehicle allowed them to relieve the daily stresses by putting the convertible top down and just cruising with the vehicle. For others, being able to get a sense of relaxation from driving the vehicle was important. The customer uses in this part of the research showed that the vehicle is often also

used in a non-performance manner, and that is as important as having the traditional performance attributes. The ability to understand the driving habits of customers will prove to be an advantage to designing a vehicle to meet all those different needs.

"You just think how life really is without the stress of work"

One of the things I enjoy is going for rides out in the country and enjoying sunsets"

"This is what I like to do with my Mustang, go cruising on the open road and enjoy the scenery"

"Comfortable, I can just sit there and relax"

Relationship to vehicle is Beyond Simple Transportation

The relationship of a customer to his or her vehicle is another area that was important. The customer forms a bond with the Mustang as part of the ownership experience. The relationship that is formed with the vehicle shows through in the way the customer views the vehicle. In customer feedback, the Mustang was described as being more than just transportation. The relationship with the vehicle was described as the vehicle being a part of the owner. In many cases, the Mustang is a symbol or metaphor, for the owner who drives it. The relationship between the vehicle and owner is important and should be understood to be able to enhance the ownership experience with the vehicle.

"I probably treat the car better than most things"

"There's a lot more to the vehicle than – there's a personality involved with it, it's a piece of you"

"I think it is more a piece of art than just, you know, transportation"

3.7 Chapter Summary

The primary objective of the study was to understand Mustang customers and gain insight into their needs and wants of their vehicle. Mustang customers are extremely knowledgeable about their vehicles, and the interviews provided a method into the eyes of the Mustang customer. The interview guide provided a good way to ensure the interviews were kept in focus and stayed on track with the objective of the project. The customers selected for the project were all current or past Mustang owners. The reason for using such a targeted group of customers was to get feedback from those who use the product on a daily basis. A customer who uses a product on a daily basis will begin to discover shortfalls in the vehicle and will express specific needs vs. a customer who drives the product only occasionally. The one-on-one interview method used to gain the voice of the customer proved to be an excellent way to engage customers. The interviews were conducted in the vehicles for the drive portions of the process. The question and answer portion of the interview provided a link into the areas of the vehicle in which the customer expressed needs or wants from the vehicle. One of the advantages of conducting the

interview in the vehicles was to gain insight by observation in addition to the verbal responses. Customers were placed into a setting similar to how they normally would use the product. Through observation and verbal responses, the data from the interview provided a broad view of customer needs. Each customer had a different way they used the vehicle. The ability to observe how they used the vehicle in addition to the questions provided a good way to gain the full perspective of the customer. The completion of the interviews and the identifying of the customer voices proved to be valuable in understanding the customer. Customer expressed needs, problems, concerns and even solutions arose in their responses during the interviews. The customer voices were taken from the interviews to begin to understand customer requirements. The voices were taken from ideas and were extracted to understand better the requirement the customer was expressing. The grouping of the voices began to form a structure of the critical areas in which customers expressed needs for the vehicle. Upon completion of the voices-to-requirements process, a total of 22 customer requirements were drawn from the customer voices.

The Affinity Diagram, for the analysis part of the study provided a way to group and understand the requirements expressed by customers. In the analysis of the affinity diagram, four main groups were developed from the voice of the customer requirements (See Figure 3.5). The groups describe the

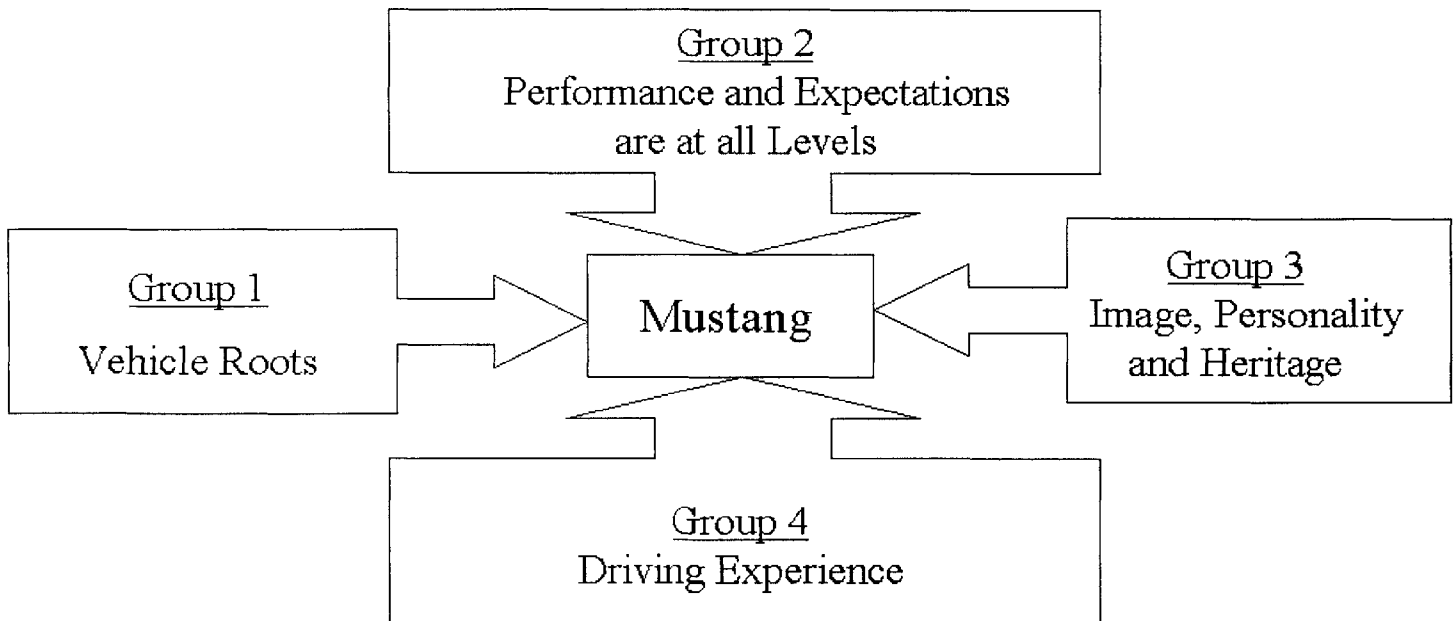


Figure 3.5 The Mustang Voice of the Customer

main areas of the vehicle that customers expressed needs or wants during the interviews.

Group 1 The “Vehicle Roots” of the Mustang have been built from its beginning back in 1964. The vehicle roots of the Mustang are seen through areas of styling, delights, quality, craftsmanship and vehicle definition with its customers. The customers felt that the styling of the vehicle needed to be leading edge, but should also keep some of the traditional Mustang styling cues. The ability to be ahead of the competition with new designs while keeping some

of the styling cues that have become part of the vehicle over the years is important to customers. Delights, as described by customers, were centered on areas in which the company is able to anticipate the future needs of customers. The ability to understand customer needs can lead to future ideas of which the customer is not yet aware. Customers defined the term quality differently. The measure of quality has many forms among customers, and the ability to understand those areas can prove to be an advantage to a company. The craftsmanship of the vehicle, in the eyes of customers, goes beyond the vehicle layout but the need to have parts of the vehicle working as one system, rather than as separate entities. The term “vehicle definition” included the customers perception of the sound of the vehicle. The Mustang has come to have a unique sound from its exhaust, and customers want that sound preserved in future models. The vehicle roots of the Mustang have been built over a 35-year history and customers expect the traditional Mustang attributes to be remain in future designs. The Mustang customer also wants leading-edge designs to be incorporated into the vehicle to complement its tradition.

Group 2

The Mustang, in the eyes of the customer, must have “Performance at all Levels.” The area of performance with customers was seen in terms of expectations, vehicle systems working together, fuel

economy and in other areas of the vehicle. The performance of the Mustang is not limited to how the vehicle takes a turn or the time from 0-60 mph in a straightaway. The customer measures the performance of the vehicle at all levels. The expectations of Mustang customers are very well defined due to their knowledge of the vehicle. The Mustang customer expects the vehicle to be powerful, have the availability of power when needed and continue to build on its reputation. The area of vehicle systems working as one entails customers want performance at all levels. The main systems of the vehicle must have a harmonious feeling of working together rather than as separate entities. For example, the customer does not want to see that the steering and suspension working separate from each other; they want the systems to feel as one. The area of fuel economy was also important in this group. The customer expects good fuel economy regardless of the model or engine type. The performance of the vehicle was also measured in other areas, such as transmission and braking. The transmission and braking of the vehicle had a direct correlation to overall performance among customers. The performance of the transmission was measured at each point of the system. The clutch effort for shifting the gears was measured by customers, and their performance through the entire system needed to be perceived as working together. The customer also expects braking

to be consistent under all conditions and speeds. The performance of the vehicle goes beyond the traditional measurements with customers, and they expect that each attribute of the vehicle perform together to provide a harmonious experience when driving.

Group 3 The “Image, Personality and Heritage” of the Mustang are important to customers. The Mustang has developed an image through the years with its customers. The Mustang has been known to be sporty, all-American and a timeless classic. The image of the Mustang has developed through its consistent design over the years. Customers expect a Mustang to remain an affordable sporty car that delivers high performance. The ability to maintain its strengths among customers is required to maintain its strong image. Vehicle personality is important to customers. Customers describe the personality of their vehicles through its customization. The level of customization varied with customers but the ability to customize their vehicle must be an option with Mustang. The heritage of the Mustang first started back in 1964. The Mustang customer, past, present and future, is reminded of the heritage of the Mustang through the horse on the grill to the short deck in the rear. The Mustang heritage means something different to each customer, but keeping the traditional Mustang styling cues will ensure that that heritage remains intact. The

Mustang has developed a strong image, personality and heritage and maintaining them is important in the eyes of its customers both past, present and future.

Group 4 Customers describe the Mustang “Driving Experience” as another important area with the vehicle. The driving experience included affordability, youth appeal and relationship with the vehicle. The Mustang is known as a fun-to-drive vehicle with customers and part of the experience is in its youth appeal. The Mustang must continue to bring attract new customers. The youth appeal in the Mustang is created within past owners and current owners as it revives their childhood memories. The Mustang has good value in the eyes of its customers and offering different models to customers strengthens part of that value. The value of the Mustang can create lifelong customers, as base model owners move up to higher end models. The success of gaining a lifelong customer is to create a relationship between the customer and the vehicle. Mustang customers felt the vehicle formed a relationship between them and the vehicle. The relationship was strengthened when the customer felt that the vehicle created an exciting driving experience.

Another area that enhanced the driving experience was to ability to understand the different diving habits of customers. The use of

the vehicle was different for each customer and being able to satisfy those different habits strengthened the experience with customers. The Mustang driving experience is important to customers and that experience is partly due to affordability, youth appeal and the relationship formed with the vehicle.

3.8 Additional Discoveries

In the initial interviews, after completion of the image discussion, I decided to go directly into part two of the interview. The interviewee had only a short time to drive the vehicle prior to questioning. The responses I was getting seemed to be short and the interviewee often seemed to be distracted. One of the things I found that enhanced the level of discussion during the interview process was to have the interviewee drive the vehicles for 15-20 minutes before starting the interview. The change in drive time allowed interviewees to clear their minds of any distractions that might have come into the interview. The result was that responses from the questioning during the interview were longer, more detailed and the interviewees communicated as though the interview was the only thing on their minds. The elimination of distractions put interviewees in a mindset to focus on the interview and thus enhanced the data being provided.

Chapter 4

4.1 Product Development and the role of the Customer

The product development process includes several stages from the inception of a product to its final production. *Ulrich and Eppinger (1995)* suggest that there are five phases in the product development process (See Figure 4.1). The first phase in the process, Concept Development, identifies needs of the target

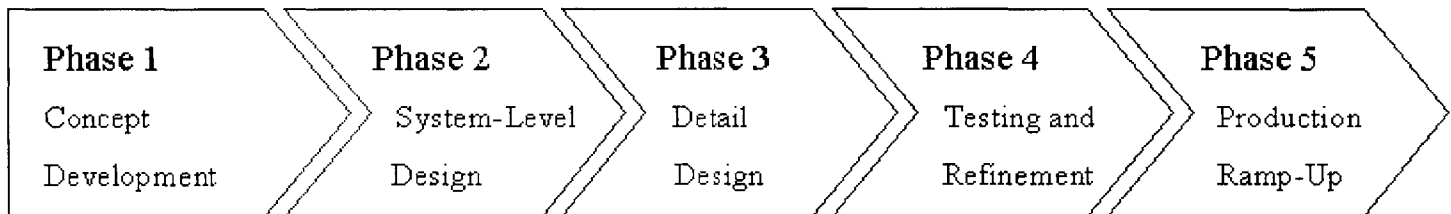


Figure 4.1 The Product Development Process adopted by Ulrich and Eppinger (1995)

customer, evaluates additional concepts, and the selection of a final concept is decided upon for further development. The second phase of the product development process, System Level Design, involves defining the product architecture, subsystems and components of the product. The Detailed Design phase, or phase three, of the product development process, is where the design specifications are finalized and suppliers are identified. The fourth phase, Testing and Refinement, is the point in the product development process when prototypes are built to product intent for evaluations. The prototypes can go

through several iterations before the refinement phase. The last phase, Production Ramp-Up, is the time when all decisions are finalized from the previous stages and production preparation is completed, and when early production builds are completed in preparation for final production.

The role of the customer in the product development process can enhance the design of a new product. The interaction of customers can also improve the potential for success of a product. *Gruner and Homburg (2000)* suggest that the interaction of customers at certain stages of the product development process and the characteristics of customers can both increase the probability of new product success. *Gruner and Homburg (2000)* contend that the early and late stages of the product development process can be the areas where customer interaction is of most value, and can have the most impact on a product. In the initial stages, idea generation and concept development is being to help define the product architecture of the future form of the product. Customer interaction at this point can provide companies with insight into areas that will help in satisfying their needs. The customer needs, known early in the process, can change, modify or enhance ideas that the company has planned for the product. The interaction of customers and understanding their needs in the initial stages will enhance the architecture of the product and will show positive effects through out the product development process. Turning to the later stages of the product development process, we can see that the critical stages in this area are the testing/refinement and production ramp-up stages. In these stages the customer can have the

greatest effect on the product development process. The testing and refinement stage is the point at which customer interaction and understanding their needs can be of most value. The product can still be modified to incorporate customer needs throughout the refinement process. The production ramp-up stage can benefit from customer input by getting early products to them and getting early feedback on the product. The feedback may indicate early flaws in the product or problems that may need to be resolved at a later point. The interaction of the customer in the early and late stages of the product development process can improve the product for its customers.

Customer Characteristics is another important area that may contribute to the success of a new product. *Gruner and Homburg (2000)* suggest four types of customer characteristics: *Lead Users, Financially Attractive, Close Customers and Technically Attractive*. Lead Users, Financially Attractive and Close Customers proved to be the best contributors to the product development process. Lead Users can be defined as individuals who, if faced with a problem, would begin to innovate to try and solve the problem. The interaction of this type of customer can help in finding innovative solutions to issues concerning a product. The customer who fits into the target market for the product and has a good representation in the market was classified as a Financially Attractive Customer. The feedback from this type of individual can give a company a good indication of what the market outlook might be for a product. The Close Customer is defined as an individual who has a close relationship with the company. The close customer can provide genuine

feedback on a product that can give a company a good measure against other customer needs. The Technically Attractive Customer is someone who may have the technical knowledge to solve some of the issues with the product. This type of customer may cause disruption in the product development process through solutions to problems, which tend to be different than the general population. The difference can cause misalignment with the company, the product and the general customer needs. The customer selection process for a new product is as important as the product itself. The right customer can give valuable data that will enhance the success of the product (see Section 2.8.1 in Chapter 2 for more details on customer selection). Customer needs play an important role in the product development process. Companies that understand the needs of their customers and implement them into their products can increase the products success in the market place.

4.2 Customer Satisfaction in a Product

The move to a customer-focus industry requires companies to measure how they are doing in the market with their products. The term “Customer Satisfaction” has been adopted in industry today as one of the main gauges of product performance. Whether a restaurant asks you to fill out a card on your satisfaction with your meal, or if you are asked how a product satisfied your needs, the trend to gauge customer satisfaction is used throughout most companies today. Customer satisfaction targets for products are continually being set higher to stay ahead of the competition. The customer requirements

for a product, if understood by a company and incorporated into the product, can have a positive impact on customer satisfaction. The failure to understand customer needs can lead to lower levels of customer satisfaction. The ability to build on customer satisfaction can also lead to “lifelong customers.” If the satisfaction level for a product is high among customers, then there is a good chance that a repeat purchase will occur for that product. Also through word-of-mouth, new customers may become interested in the product, as well. In looking long term, if a product can keep current customers and attract potential new customers, then the outlook for long-term growth will increase. Customer satisfaction, and its growth in popularity, can be a good indicator for a product’s success, both today and in the future, for profitability and market share.

4.3 Customer Satisfaction and the Kano Model

Customer Satisfaction can be good indicator of how well a company or product incorporates the voice of the customer. One of the measures of the success of a product is customer satisfaction. In the first part of this study we obtained the voice of the customer on the Mustang. The voice of the customer provides important insight into product needs. The customer voices can then be translated into requirements (see Section 2.8.5 of Chapter Two). The requirements were then put into an affinity diagram for analysis. One of the methods for linking customer requirements to customer satisfaction is the *Kano Model*. The Kano Model is a tool that is being used to better understand

the effects on customer satisfaction. The model also provides a link into how requirements affect the level of customer satisfaction at three different levels.

In trying to understand the Kano model, we must look at how product requirements influence customer satisfaction. The Kano Model distinguishes three types of product requirements (See Figure 4.2).

- **“Must-be” Requirements** – The Must-Be requirements are what the customer expects to be on the vehicle and functioning properly. In most cases, the customer doesn’t think about these requirements until they are either missing or not functioning properly. Customers also assume that the requirements in this area have been addressed, and are expected. If the vehicle does not fulfill these requirements, the customer will become dissatisfied. An automotive example might be a transmission failure. The customer expects that the transmission will function properly throughout the life of the vehicle with proper maintenance. The failure of the transmission will lead to customer dissatisfaction. The requirements in the “Must Be” area of the Kano Model are basic to the product and if not incorporated, can lead to disinterest in the product. The must-be requirements are not negotiable with customers, they expect them to be there and perform well.

- **“One-Dimensional” Requirements** – In the area of One-Dimensional requirements, customer satisfaction is in direct proportion to improvements in how satisfied customers are in this area. The requirements in this area are measurable and, as the requirement improves in the eyes of the customer, the more they will be satisfied. Customer requirements in this area are usually in high demand with customers. An automotive example might be in the area of craftsmanship. If the customer perception of the craftsmanship of the vehicle is high, they will be satisfied. If their perception of craftsmanship is low, they may not be completely dissatisfied, but improvement will increase their satisfaction. The one-dimensional requirements are can be gauged by customers, and the greater the satisfaction with a requirement, the greater the overall customer satisfaction will be.
- **“Attractive” Requirements** – The area of attractive requirements can be classified as “surprise and delights.” The term surprise and delights can be defined as requirements not expected by customers, but once they are introduced to them, they become surprised. The requirements in this area delight the customer and increases customer satisfaction to a greater degree than one-dimensions requirements. Attractive requirements can be either be seen or not seen. An example might be a power-lift tailgate on a

minivan. The customer may not expect this feature, but once they are introduced to it, they become delighted. An example of unseen requirement might be interior noise in a vehicle. If a vehicle is quiet, the customer may not directly notice the requirement, but if the vehicle is noisy in the interior, then dissatisfaction may occur. The requirements in this area of the Kano model have the greatest potential to increase customer satisfaction.

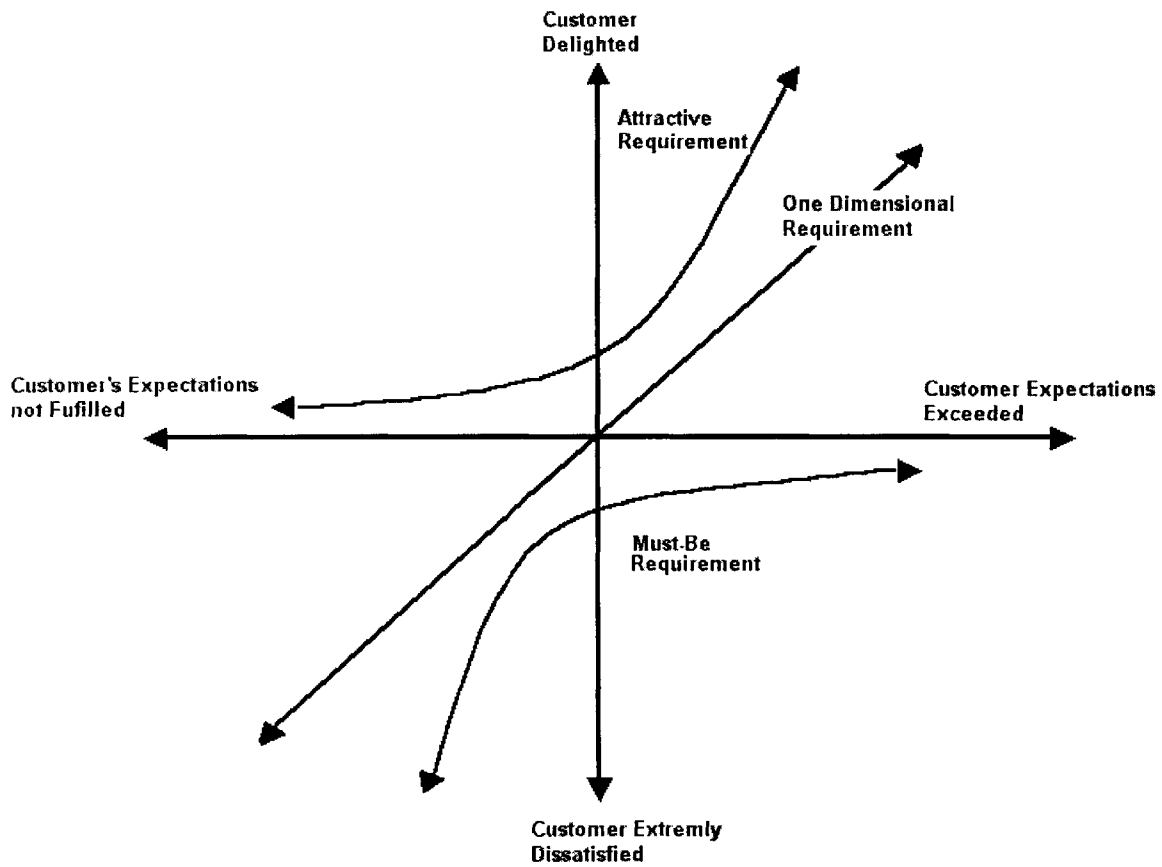


Figure 4.2 - Kano's Model of Customer Satisfaction adopted by Berger et al. , (1993)

4.4 Mustang Customer Requirements and the Kano Model

The Mustang requirements (discussed in Chapter 3) from the first part of the study were linked to the Kano model to gauge their impact on customer satisfaction (See Figure 4.3). If we look at the Mustang Kano Model, we see that the areas of opportunities for increasing customer satisfaction fall in all three levels. The “Attractive Requirements” leads to areas such as styling, features, youth appeal and creating excitement. The areas for “One Dimensional Requirements” show that vehicle sound, craftsmanship, attribute interaction, fuel economy, value, understanding the driver and customization are important. In looking at the “Must Be Requirements” we can see that the customer expects quality, vehicle performance, transmission performance, brake performance and traditional Mustang attributes to be part of the vehicle. The area for greatest impact on customer satisfaction is in the area of attractive requirements. The vehicle can exceed customer expectations if these areas are incorporated into the base vehicle. The one-dimensional requirements offer the next best opportunity for increases in customer satisfaction. As the product improves in this area, customer satisfaction will increase proportionally. The

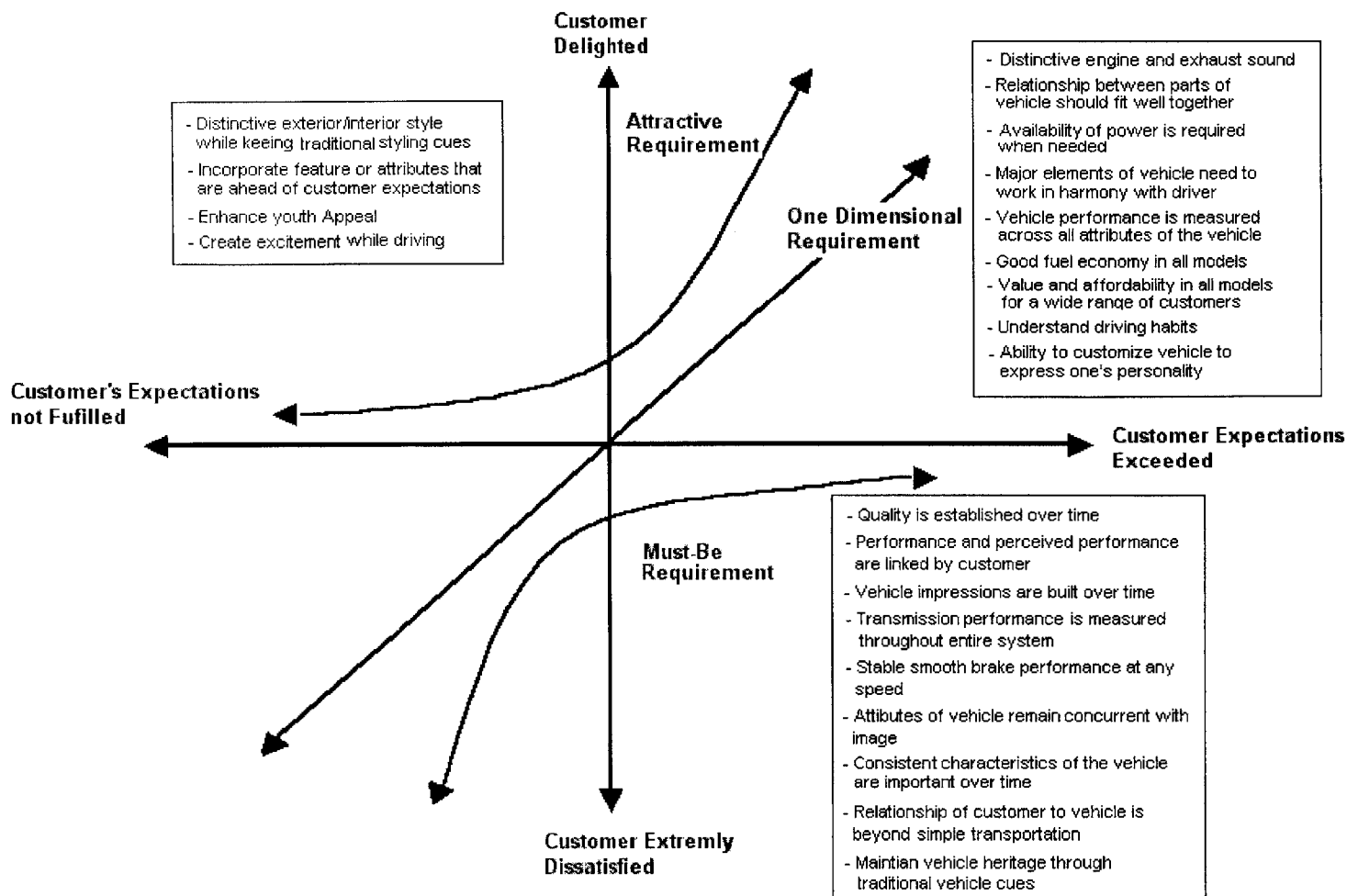


Figure 4.3 - Mustang Customer Requirements linked to Kano's Model of Customer Satisfaction

"must-be" requirements are the areas where the customer expects the requirements to be part of the vehicle. Understanding the requirements in this area is important to maintaining current levels of satisfaction. The Kano model offers a company the opportunity to see how an increase in customer requirements can impact customer satisfaction. The model also offers some insight into how requirements can be leveraged, the impacts of trade-offs and shows the flexibility to decide which requirements to attack first. The ability of

a company to truly understand its customer needs and how those needs impact customer satisfaction can be a good way to grow market share, increase profitability and of stay ahead of the competition.

4.4.1 Product Requirements and the Product Development Process

In looking at the product development process, when should the Mustang Product requirements be incorporated or implemented? If we refer back to the product development process discussed in section 4.1. it was shown that there are five stages in the product development process. The Mustang study produced 22 product requirements. The stages in the product development process to incorporate the Mustang product requirements will differ as to when they should be addressed. The Mustang Product requirements were incorporated into the Kano model and were shown to have three types of product (See Figure 4.3). The “Must Be” requirements for the Mustang are expected to be part of the vehicle and perform well.

One of the requirements with customers in this area was that the vehicle braking system must be stable and smooth. The area in the product development process that can best address this requirement is in the early stages (See Figure 4.1). The system-level design phase (Phase 2) and the detailed design phase (Phase 3) would be the optimal time for incorporating this product requirement. The system level design phase would define the braking sub-system for the vehicle. The detailed design phase would finalize the specifications for the braking system and get suppliers on board for design

agreements for the braking system. In most cases, the point to address “must-be” requirements of the Kano model is in the early stages of the product development process.

The one-dimensional requirements for the Mustang can be best addressed in the concept development and testing/refinement phases of the product development process. One of the Mustang product requirements expressed from the research expressed a need to customize their vehicle to express their personality. The meaning of customization for Mustang customers was the ability to modify the vehicle after purchase. The concept development phase would be the best area to address this requirement. Defining the concept is done at this stage and decisions can be made to ensure that the vehicle has customization capabilities for its customers. In looking at the customer requirement for distinctive engine and exhaust noise for the Mustang, the testing and refinement phase would provide the best time to address this requirement. The development of the vehicle sound can be finalized through in this stage. If the vehicle requires design changes to meet the noise requirement of its customers, this phase can provide the best opportunity to complete the final designs. The one-dimensional requirements can be addressed best in the early and late-middle phases of the product development process.

The attractive requirements of the Kano model would be best addressed in the concept development and system-level design phases of the product development process. Recalling the attractive requirements, they are

things about a product that "Surprise and Delight" the customer. The attractive requirements have the most significant effect on customer satisfaction. One of the product requirements in this area of the Mustang was to incorporate features that are ahead of customer expectations. The ability to incorporate features in the vehicle that customers are not aware of yet must be done early in the product development process. Looking back at the fourth-door example in the minivan market. The decision to incorporate a fourth door in a design requires that a company make that decision very early in the product development process to ensure that design considerations are incorporated throughout the product development process. It is difficult to know how a product decision early in the development process will be accepted with customers, but the likelihood of their incorporation must be understood early in the process. The product development process requires incorporation of product requirements expressed by customers and an understanding of the optimal time in the process for implementation will improve product satisfaction among customers.

4.5 Dynamics of Competition

The customer has many choices when selecting a product and many products to choose from when making a purchase. The competitive market provides customers with a wide range of products for their needs. In looking at their competition, companies gauge how their product is performing against others through market share and with customers through satisfaction or sales.

Market Share can be a good indicator of how a company's product is performing against its competition. A product's market share can identify who is becoming more or less competitive, identify the major players in a certain market and, when shifts happen in market share, it can show who is losing or gaining market share.

Porter (1998) suggests that the state of competition in a market is dependent on five competitive forces (See Figure 4.4). Those forces are described as: 1. Threat of entries into a market; 2. Bargaining power of suppliers; 3. Bargaining power of buyers; 4. Threat of substitute products; and

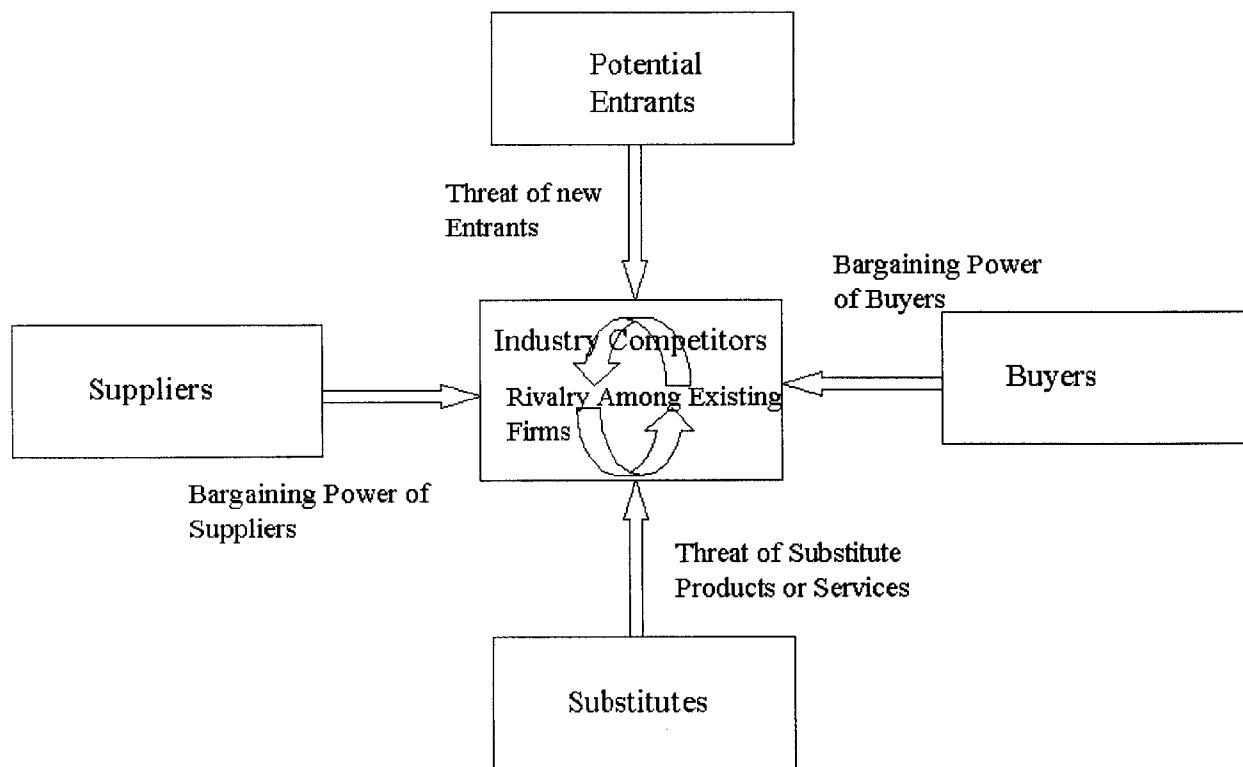


Figure 4.4. Forces Driving Industry Competition adopted from Porter (1998)

5. Rivalry among existing companies. The powers of the five forces, which sometimes reside outside an individual company, can and usually do affect the market when changes occur.

Porter (1998) contends that the strength of these forces can ultimately affect the profit potential for an industry. The term “profit potential” is the return on invested capital in the long run. The Threat of New Entrants can be framed as companies coming into the market with a new product that could take market share from current players in that market. In looking at new entrants into a market, the industry must understand the product being introduced by a new competitor and the impact on its products. Existing companies must consider the entry of a new product into a market and its potential with customers. The bargaining power of suppliers is also a threat in the competitive market. Depending on how large or small the supplier is, they can have a significant effect on competition. If a company depends solely on one supplier, then the supplier has a significant leverage point. For example, if the supplier decides to raise prices or cut production, it can have a direct effect on a company, its market share and its ability to compete. The power of the buyer or customer can also have an influence on competition. A customer has the ability to dictate products price, level of quality and market share through their buying preferences, and those preferences will influence competition. The threat of substitute products will also influence the competition. Products that can perform functions similar to a company’s product can divert customers from one product to another. The loss of product sales to alternatives will

affect competitiveness and market share of existing products. Rivalry among existing companies is another competitive force between products. Examples of rivalry actions between companies to gain a competitive advantage may come in the form of price changes, discounts, or other similar actions, may be taken if an opportunity is seen to increase the competitiveness of a product. The five forces can impact a market and competition in that market. A careful analysis of these competitive forces in a market must be undertaken. Once the ramifications are understood by a company, they can provide the knowledge to stay ahead of competitors.

4.5.1 Traditional Competitors – The “Game Theory”

The Mustang is the industry leader in the performance-car market in the United States and it takes continuous effort to stay ahead of the competition and remain in that top spot. The term “Traditional Competitor” will be used to define products that are in direct competition with each other. The term “Game Theory,” as described by *Oster (1999)*, helps in developing and understanding the interactions between companies. The Chevrolet Camaro, since its introduction, has been in direct competition with the Mustang. Like the Mustang, the Camaro is offered in a six- and eight-cylinder models, as well as coupes and convertibles. *Oster (1999)* contends that the results of our decisions are not only dependent on what a company decides, but what the competition does as well. The game theory among rivals can influence decisions made by the companies in their products. For example, when

Chrysler introduced a fourth door on its minivans, it was an industry first. The other automotive companies, seeing the success of this option with customers, shortly thereafter introduced a fourth door and followed suit with their own products. In many cases, a product will be introduced with a new feature ahead of a competitor and, if its results are positive with customers, then the competitor will, in many cases, design that feature into its own product. Another example was the introduction of the Lincoln Navigator Sport Utility Vehicle by Ford Motor Company. The Navigator was the first full-size entrant in the luxury market. The success of the Navigator prompted General Motors to introduce the Cadillac Escalade, their version of a full-size luxury sport utility vehicle. A third example can be seen in the airline industry. The major players in the airline industry have a substantial amount of control of how pricing will be determined. If one of the airlines raises or lowers fare prices it is likely that the rest of the industry will follow with similar actions. The fare-price change of one airline company results in similar moves from others in the industry. The idea of the game theory is a good method to track the actions and reactions of other companies in a certain industry. In the automotive field the game theory is more a sequential type of game. The move or action made by one company usually results in a reaction from other companies. In looking at this type of behavior, companies must understand what move the competition is likely to make based on the actions they plan to take on their products. The rivalry between the Mustang and the Camaro has been getting stronger in recent years and each company is continually trying to make

actions and anticipate reactions of each other to meet the needs of their customers. Looking ahead to understand the reactions of other companies is a necessary process to stay ahead of the game.

4.5.2 Non-Traditional Competitors

In addition to traditional competitors, companies must also consider potential non-traditional competitors. The term non-traditional competitor is defined as a company that makes products that are not currently competitive, but might be in the future. Potential competitors may not currently be in direct competition with a company's product. A new competitor may come about due to a change in the market needs, customer preferences may change or an outside source may force a change in the market. An example might be if the market sees a dramatic increase in fuel prices. The increase may lead customers to more fuel-efficient vehicles, resulting a product to compete in a different market. In looking at the threat of new entrants into a market, *Porter (1998)* contends that there are six major sources that serve as barriers to new entrants in a market. One of the barriers, Economies of Scale, may force a new entrant to enter a market on either a large scale or a small scale. The disadvantage of entering on large scale is that the existing firms in the market may react strongly toward the new entrant. The disadvantage of entering on a small scale is that small volumes will prove to have a higher cost and may limit sales. The barrier of Product Differentiation can be problematic for new entrants due to customer loyalties with existing products. In order to persuade

customers to buy their product, new entrants may have to spend large amounts of money to break some of those loyalties. Capital Requirements can also be a barrier to entry. The amount of capital required to enter a market with a new product can be high and risky with an uncertain outcome. The concept of Switching Costs can also pose problems for new entrants. The consumer may have to incur a cost or penalty to switch to a new product and may decide, instead, to remain with their current product. The availability of Distribution Channels can also be a barrier for new entrants. Once the product is produced, the method of getting the product to potential customers may cause issues for new entrants. The last barrier of entry may come from Governmental Policy. The strength of the government may deter new entrants from entering a market with their product. Standards, regulations, restrictions and environmental concerns are examples of issues new entrants may face. The Mustang has direct and indirect competition from vehicles both in and out of its vehicle class, but knowing the capabilities of future competitors and the role they might play in the market, can lead to a competitive advantage.

4.6 Chapter Summary

Product Development and the Voice of the Customer are becoming more integrated in the products of today's companies. The products being produced are designed with customer input and customers' needs in mind. The product development system contains many steps, and knowing the effect of the customer voice in each stage can provide valuable information, which can

contribute in the success of the product. *Gruner and Homburg (2000)* contend that input in the early and late stages in the development process produce the best results. The characteristics of the customer also plays a role in the type and usefulness of the information used in the development process. The customer requirements and the impact on customer satisfaction are also important. In looking at the Kano Model and linking customer requirements into the model gives a good idea as to how those requirements will impact customer satisfaction. The Must-Be, One-Dimensional and Attractive requirements of the Kano Model will have different impacts on customer satisfaction. The Mustang customer requirements, when mapped on the Kano model, showed that in each area of satisfaction, there is opportunity for improvement with customers. The process by which a company decides to address these requirements will have different impacts on the level of satisfaction with customers. The trade-offs on how to get the highest customer satisfaction in a product is important and can improve the potential success of a product. The level of competition within a market is another consideration that companies must understand when designing their products. The understanding of the forces that dictate changes in competition should be monitored, and companies should gauge how these forces affect their product. The competition between companies can provide actions and reactions in the market. The ability to understanding how to keep your product ahead of the actions of others and anticipate them can provide a advantage for your product. The Product Development System is the mechanism that we use to

develop products, but the success of those products has a direct link with its customers.

Chapter 5

5.1. Conclusions

The move toward customer-driven products is shaping the products of today and the future. A company's ability to understand and implement the voice of the customer into their products can enhance the success of a product in the market place. Companies are interested in customer needs, how the product is used and what non-verbal needs are expressed by their customers. The method to gain the voice of the customer can range from focus groups to one-on-one interviews. The voice of the customer method can vary by company or by the type of information required for a project. Once the best method is chosen, the preparation for the project is one of the key steps toward gaining valuable data that will provide solutions to the objective of the project.

Customer selection is another critical step in the process. The target customers selected, if chosen correctly, can provide data that will give meaningful insight into what the market wants from a product. The analysis of the voice of the customer can be done in many ways. The customer voices that express a need, want, key issue, problem, or that provide information into a solution, will help a company develop the requirements of their customers. The use of an affinity diagram can provide an excellent framework for analysis of the customer's requirements. The analysis of the customer requirements identified four distinct groups among customers. The four main groups included 11 subgroups and 22 customer requirements. The affinity diagram

provided insight in the critical areas in which Mustang customers voiced needs. The interview method and analysis provided in-depth understating of how Mustang customers view their vehicle and the expectations they have of the Mustang. The linking of customer requirements to Product Development can provide insights into how customer requirements will affect a product and how the development process can be affected by customers. The product development process has many stages, and the level and timing of each stage can have positive effects on the success of a product. The process of meeting the requirements of customers also affects customer satisfaction. Customer satisfaction is driving the market of the future and companies are using it as a gauge of how well a product will compete in a market. The effect on customer satisfaction can be understood through the Kano Model. The Kano Model provides insight into the level of importance and how addressing customer requirements affects customer satisfaction. The understanding of competition can also be an advantage to companies. The actions and reactions of companies continue to change products in the market. A company that can understand how the actions they make will effect the competition will prove be an advantage with customers and their product. Customers and their voices are powerful tools for companies, and being able to gain that voice, understand it and implement it will help in a company's effort to be a leader in the market.

5.2. Future Research

The focus of this study was to gain, understand, develop and link customer requirements to the product development process. The study also defined areas of customer need within Mustang. However there are next steps that can be accomplished to provide further analysis of customer requirements. Future research can focus on developing a rating system to determine the highest priority requirements with customers. That process may be done through a ranking method or survey with large groups of customers. The importance of the requirements can then be gauged against the Kano model to see what impact they will have on customer satisfaction. Another method of obtaining the voice of the customer (i.e. focus groups) might be used for comparison to the one-on-one method used in this study. The trial of an Internet-based study can also be done to see the correlation between the one-on-one method and Internet results. The requirements from the Internet study can be used to see if customers provide different results for the voice of the Mustang customer.

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