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An empirical and fuzzy logic approach to product quality and purchase intention of customers in two wheelers



Kottala Sri Yogi*

Department of Industrial & Production Engineering, Institute of Technology, Guru Ghasidas Vishwavidyala (A Central University), Bilaspur 495001, Chhattisgarh, India

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ABSTRACT

This research paper investigates the level of product quality based on the dimensions of quality. Customers' priorities when purchasing a two wheeler have been analysed for different manufacturers using a structured questionnaire. This study uses both an empirical and a fuzzy logic approach to accomplish the research objectives. Among the different brands that are available in the Indian two wheeler market, customers have given priority to high trade-in value, power to climb hilly areas, ease of modification, availability of many accessories, and high pick up during overtaking. This research highlights the effect of high trade value on performance, an effective braking system effect on reliability, and engine life on durability; among two wheeler customers, a two wheeler's conformance to specifications has a positive relationship with lower maintenance during the purchasing process. This study has proposed a framework for product quality and purchasing strategies for customers when buying two wheelers that takes into account the factors affecting the purchase of two wheelers in the Indian market.

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1. Introduction

Customers' ever changing demands and priorities for product features force manufacturers to produce quality products, which has a significant impact on the product or service performance. Product quality is thus linked to customers' value and satisfaction, both of which are vital for the marketer's product positioning tools. In this competitive environment and dynamic market, no two wheeler manufacturing company can survive without knowing its product's strengths and weaknesses. Manufacturers must fortify themselves against threats from the market environment and exploit their strengths or increase profits. To do so, the company must conduct regular surveys to understand customers' opinions, needs and preferences as part of incorporating the "voice of customer". This helps companies to manufacture product that meet customers' expectations. Satisfaction entails a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance to his or her expectation. Thus, when a

company is positioning itself in a dynamic business environment with competitive advantage, it is necessary to incorporate the determinants of customer satisfaction. Consumer behaviour may be defined as the decision process and physical activity in which individuals engage when evaluating, acquiring, using or disposing of goods or services.¹ Studies taking a social perspective on two wheeler promotional strategies in Kerala, India have been influenced by social, economic and technological factors (Rameswaran). The objective of this paper is to understand the dimensions of quality and their effect on the purchase intention of two wheelers as a product, different factors that exist between customers' perceptions and the two wheeler purchase decision. Jhon and Christopher (2013) found a positive trend regarding the influence of peers on the decision to purchase a two wheeler in Coimbatore, India. In this study, a questionnaire has been administered to customers who bought two wheelers in India.

This paper comprises five sections:

1. An introduction to the Indian two wheeler market and the research objectives

* Corresponding author. Tel.: +91 9575200766 (mobile).

E-mail address: kottalasriyogi@gmail.com.

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¹ Source: <http://www.wbiconpro.com/446-Rameswaran.pdf>.

2. A literature review discussing the purchase intention of automobiles; purchase intention among Malaysian consumers; the relationship between purchase intentions and country of origin, perceived quality and brand; and fuzzy logic and purchase intention.
3. Research methodology covering research design and the measurement of product quality and purchasing intention of two wheelers using the fuzzy logic approach.
4. Results and discussion covering descriptive statistics, measurement validation, aggregated fuzzy priority weighting and ranking of main-level indices.
5. Conclusion and limitations of the study.

1.1. Indian two wheeler market

In the Indian automobile industry, the two wheeler segment contributes the greatest volume amongst all of the segments at a size of Rs 100,000 million annually. The Indian automobile segment can be broadly categorized into three sub segments: scooters, motor cycles and mopeds, while some categories are formed by combination of two or more segments. The two wheeler segment has five players and most of the companies have foreign collaborators. Most of the companies are currently planning for 100% subsidiaries in India.

According to an automotive mission plan report covering 2006–2016² from the Indian Ministry of Heavy Industries and Public Enterprises, there are fourteen two wheeler manufacturing companies operating in India. However, the dominant players are Hero, which has eight models available; Bajaj, Yamaha, Honda and Royal Enfield, each of which has five models; and TVS Motor Company, which manufactures four models available in the Indian market.

The world's largest two wheeler manufacturer and seller, Hero Moto Corp, has an annual sales turnover of US 15 billion dollars. This is largely due to the significant growth of the Indian two wheeler industry, which has grown along with people's personal disposable incomes and is expected to have a continuing positive impact on India's economic growth in the coming years. Ten percent of India's annual GDP comes from the design and manufacture of automobiles and auto components with a market value of US 145 billion dollars, and sector employment is expected to grow to 25 million people by 2016.

According to a report on the Indian two wheeler industry published by ICRA Limited, the projected volume of growth in the two wheeler industry from 2014 to 15 is 14.8%. The volume of growth in the scooter segment is particularly high, predicted to be 30.7% from 2014 to 15, continuing a trend of robust segment growth due to the entry of new models from different manufacturers. As Honda continues to grow its market share, new model launches by TVS support its volume growth in 2014–15, both of which have contributed to positive trends in the two wheeler manufacturing industry.

1.2. Research objectives

1. To determine the important factors affecting the purchase of two wheelers in the Indian market.
2. To study the dimensions of quality and its effect on the purchase intention of two wheelers as a product.

3. To develop a framework for product quality and purchasing strategy for customers buying two wheelers in the Indian market.

A research gap emerged from studies on purchase intention among consumers of two wheelers in India: as of yet, no empirical and fuzzy logic approach studies have been performed. The dimensions of quality in relation to product quality as a purchasing strategy among Indian two wheeler customers is abstracted in the literature.

2. Literature review

2.1. Methodology of literature review

Internationally available and refereed scholarly journals and publications were used as the sources for this literature review. The search for contemporary journal publications was carried out on Scopus, Google Scholar, Emerald Insight and refereed international conference publications. The keywords used in the search were quality, durability, performance, reliability, dimensions of quality, country of origin (COO), brand, purchasing intention, soft computing, fuzzy logic and automobile. For this search, the most relevant one hundred and one research papers in terms of technical content published in the last ten years were considered for review. The remainder of this section is classified into five sub sections: 1) purchase intentions of automobile, 2) purchase intentions of automobile among Malaysian consumers, 3) purchase intentions and country of origin, 4) purchase intention as it relates to perceived quality and brand, and 5) fuzzy logic and customer behaviour.

From [Table 1](#) Literature on purchase intention in automobiles covering four wheelers among consumers from Sri Lanka, Africa, the U.K and Algeria with a special focus on India. Significant work pioneered that influencing factors in purchasing an automobile include: purchase intention, consumer behaviours, customer service, disposable income, brand image, environmental consciousness cultural factors, customer loyalty, customer attitude, safety and quality of service.

From [Table 2](#), purchase intention among Malaysian automobile consumers; researchers found that perceived quality, value, environmental issues, brand loyalty, product quality, religiosity, price sensitivity safety and ethnocentric tendencies are all influencing factors.

2.2. Purchase intentions and country of origin

According to [Nagashima \(1970\)](#), a product's country of origin conjures images of the reputation and stereotypes that businessmen and consumers attach to products from a specific country. This image is created by variables like representative products, national characteristics, economic and political background, history and traditions.

When choosing a particular automobile, country of origin has a significant effect that holds when considering the purchase of a two wheeler or four wheeler. As demonstrated by significant studies on purchase intention and country of origin, some of the influencing factors in this context that emerged from the literature review are brand, ethnocentrism, perceived quality, product knowledge, consumers' decision making processes, product origin and foreign products [Table 3](#).

2.3. Dimensions of quality

There are many different definitions and dimensions of quality discussed in the academic literature on quality. One of the most

² Source: <http://www.siamindia.com/uploads/filemanager/19ReviewofAutomotiveMissionPlan2006-2016.pdf>.

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