Industrial Marketing Applications of Quantum Measurement Techniques

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The objective of the present work is to give a justification of the hierarchy formed by certain criteria that regulate industrial marketing based on a postacquisition evaluation of the product by users. The industrial market we consider is that of agricultural machinery, in particular, the tractor. A test is designed with the items taking into consideration just the two marketing-related elements, product and price. These items define a latent variable "suitability" that will serve as the support for obtaining an empirical measure allowing a hieracrchy of the aforementioned criteria to be formed. The methodology used is Quantum Measurement, a technique based on Rasch probability. The data used give a measure of suitability for each tractor and for each item, as well as an analysis of misfits that constitute a quality control for the data being considered. The resulting measure objectively corroborates the accepted hierarchy of industrial marketing criteria, and contributes the new result of a hierarchy of attributes corresponding to the tractor. © 2000 Elsevier Science Inc. All rights reserved.

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INTRODUCTION

Industrial markets are characterized by transactions concerning goods and services used to obtain products that are themselves the object of subsequent commercialization, that is, the marketing of goods and services whose destiny is not the final consumer, is known as industrial marketing [1]. While the complexity of industrial marketing has led to it being studied very little, it is of vital importance for businesses, industry, and the economy. A great many factors influence industrial purchasing, but they are not all equally significant; the characteristics of industrial marketing form a hierarchy.

The agricultural machinery market is one of those that are the object of industrial marketing.

The objective of the present work is to justify empirically the hierarchy of some of the most relevant characteristics of industrial marketing, based on a measure obtained from an assessment of the product made by users after acquisition.

The agricultural machinery market is one that is the object of industrial marketing, and that is why we selected it as a case study for the present work. One of its most significant exponents is the tractor, as this presents one of the greatest degrees of differentiation by brand-name and characteristics. The characteristics chosen are a series of elements that refer to two of the elements of the marketing mix (product and price). These attributes define a latent variable "suitability", whose measure (the closeness to an ideal) is computed by the Quantum Measurement Technique based on Rasch probability by means of a test where the items correspond to the attributes of a tractor according to the opinion of farm machinery experts. This test was given to the owners of different makes of tractor constituting this market, who evaluated each item according to their personal experience with the tractor that they owned.

The data gave a measure of each tractor and of each attribute. The measure of the latter fixes a hierarchy of the characteristics (relative to the product and price) that govern industrial marketing.

The work is organized as follows: (1) theoretical justification of the selection of characteristics; (2) establishment of a methodology that will allow us to form a hierarchy of these characteristics; and (3) application of the Quantum Measurement Technique to the data.

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We attain the goal of establishing a measure order for the selected attributes that corresponds to the hierarchy of industrial marketing criteria.

There is also the new contribution of a hierarchy of the attibutes of the tractor as an industrial product.

PRODUCT AND PRICE IN INDUSTRIAL MARKETING

An effective marketing program depends on a detailed understanding of market strategy, and of the type of organization aimed at, as well as of the products being sold [2]. In this sense, one has to know the industrial buyer's preferences to design a suitable marketing strategy.

Two fundamental aspects on which industrial product success is based are attributes related to quality and service. However, manufacturers at times focus on the tangible quality of the product and forget the considerations of quality of service [3]. It is very important that the manufacturer should consider that when the buyer acquires a product, it is not only the best technology being sought, but the optimal solution to his/her problems, that is, total quality. A successful relationship requires a true commitment on the part of the seller to respond to the buyer's expectation, that is, to keep one's word [4], and these commitments are centered on adequate technical service. In this sense, "Although product innovation, positioning, and technology are important to the growth of a business firm, high-quality product and customer services provide the real competitive advantage" [5]. Hence, service plays a major role in sales because its presence can be used to differentiate the offer of one seller from another [6]. Industrial companies therefore must understand that service together with the product's physical quality forms to an ever greater degree the basis of competitiveness [7].

Another attribute of ever increasing priority is that of design [8]. Consumers attach different values to the various attributes that comprise a product's design, such as