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Kano's model in Kansei Engineering to evaluate subjective real estate consumer preferences

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ABSTRACT

Kansei Engineering is a product development tool used to identify users' perceptions and find quantitative relationships between their subjective responses and design features. This paper proposes the use of Kano's model in this process to analyse the impact of different subjective attributes on consumers' purchase decisions. A practical example of real estate promotions design is presented. In the first stage, semantic differential is used to measure the subjective component of the emotional state. In the second stage, regression analysis and Kano's model are used to define the relative weight of each emotional attribute in the purchase decision. Besides linear attributes, Kano's model identified two other kinds of attributes that present a non-linear performance: basic attributes and exciting attributes. Therefore linear models could underestimate the effect of such kind of attributes.

Relevance to industry: This information is very relevant for architects and designers as it enables them to determine the extent to which they must direct their efforts at improving certain attributes with the object of improving the global evaluation.

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1. Introduction

The study of perception in the sphere of architecture is of great interest to architects and designers, especially at certain times where the inclusion of user needs and preferences in housing design can give a competitive advantage for a real estate company, as in the case in Spain. At the beginning of this decade Spain had the highest rate of construction in the Euro zone countries, and in 2004 was five percentage points above the European average. The strong real estate sector and in particular the residential market took the construction of new properties in Spain to record levels. While in 1997 over 250,000 properties were built, in 2005 this figure exceeded 650,000. The situation, however, changed radically in the second half of 2008. The world economic crisis and excess supply in the Spanish real estate market brought a slowdown in consumption and investment. In fact, new housing prices dropped in 2009. This scenario is causing real estate companies to consider the need for strategies which could give them a competitive advantage in the market. This is where the study of user needs, desires and preferences becomes particularly important.

Several techniques can be used to translate consumer or user needs and preferences into product design characteristics. These techniques include Quality Function Development (QFD), which can be used to identify relationships between customers' (functional) needs and engineering characteristics (Akao, 1990; Cohen, 1995), Conjoint analysis (Green and Srinivasan, 1978) which provides information on which product characteristics are most important to the customer, and Kansei Engineering. Nagamachi defines Kansei Engineering as "translating technology of a consumer's feeling and image for a product into design elements" (Nagamachi, 1995). Kansei Engineering is a methodology developed in the 1970s at the Kure Institute of Technology (Hiroshima, Japan). Kansei Engineering has some advantages over the other above-mentioned techniques. Firstly, Kansei Engineering establishes a suitable framework for working with symbolic attributes and user perceptions, expressed in their own words. Other techniques base product development on user preferences for functional aspects considered in terms defined by experts. It also establishes a framework for quantifying the relationships between design characteristics and emotional responses (Nagamachi, 1989, 1995; Demirtas et al., 2009). These contributions are very useful in areas such as real estate, where emotional impressions can explain a significant part of the variance associated with the purchase decision.

In the real estate sector, several studies have analysed the relationship between a building's physical characteristics and the

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