

Using BPNN and DEMATEL to modify importance-performance analysis model-A
study of the computer industry

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Abstract

The importance-performance analysis (IPA) model has been widely used as the primary tool for customer satisfaction management. IPA is a 2-D matrix analysis based on the importance and performance of the organization from the customer perception of quality. The firm's customer satisfaction management strategy is formulated according to the IPA analysis results. However, both conventional and modified IPA models have important hidden assumptions: (1) assumptions regarding the importance of quality characteristics and performance; (2) the assumption that performance and satisfaction have a linear relationship; (3) that quality characteristics are mutually independent variables, with no causal relationship. Under these assumptions, if the quality characteristics cannot meet the above-mentioned assumptions, the conventional and modified IPA models will not accurately analyze the importance and priority ranking for improvement, leading to wrongful decision making. This study puts forth a new decision making and analysis methodology that will, on one hand, exploit the back-propagation neural network (BPNN) to establish quality characteristics and the hidden important integral satisfaction assumptions. The decision making trial and evaluation laboratory (DEMATEL) is used to calculate the causal relationship and extent of mutual influence among the qualities to adjust the importance of the

quality characteristics and identify the core Order-Winners and Qualifiers problems. The proposed method modifies the quality importance and improves the IPA model ranking and also resolves difficult practical problems with fewer resources. This study illustrates using Taiwan industrial computer, working in conjunction with IPA models established with BPNN and DEMATEL to observe its application and effect.

Keyword : Importance - performance analysis