

Green Supplier Selection Models Utilizing Voting Analytic Hierarchy Process

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Abstract

Abstract. The high-tech industries in Taiwan have developed rapidly in recent years, in terms of production value, export value, number of employees, and R&D expenditures. The sector of computer, communication and consumer electronic is nicknamed 3C industry in Taiwan. The sector is the most flourishing force in the domestic economy. Nowadays, environmental impacts play a key role in sustainable operations of a business. Many environmental protection laws and regulations have been released and enforced globally. The responsibility of environmental protection for manufacturers is extended through the product life-cycle to customers. Green supply chain management thus becomes more important for manufacturers to ensure that their production network could provide environmentally conscious (green) products. In order to pursue a pleasing green supply chain, green supplier management is an essential concept for businesses to obtain sustainable operations. The intention of this research is to assist the 3C companies to select green suppliers via the utilization of voting analytic hierarchy process method (VAHP). In short, the objective of this research is threefold: (1) to assess the current operation of green supplier evaluation in the 3C industry in Taiwan, (2) to establish green supplier evaluation criteria using VAHP, and (3) to collaboratively design the evaluation process according to the previously established criteria. The findings of this research are as follows: (1) There were 15 green supplier evaluation criteria established under three green categories, namely environment management, production techniques, and design performance. (2) With the aid of VAHP, the weight

of each criterion was calculated to present the priority of each criterion. (3) An evaluation form consisting of green criteria and weights was constructed to facilitate the supplier selection process.

Keyword : Green Supply Chain, Suppliers Selection, Voting Analytic Hierarchy Process (VAHP), 3C industry