Analysis of Green Design Criteria and Alternative Evaluation Processes for 3C Products

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Abstract

Abstract. The sector of computer, communication and consumer electronic are nicknamed 3C industry in Taiwan. The 3C products play an important role in our daily life. Its environmental impact is also obvious gradually. The environmental protection issue on 3C products has become focal points worldwide. In recent years, environmental protection laws, such as RoHS and WEEE, were implemented one after another. The 3C companies have to design products that comply with the environmental protection laws by including concepts of design for environment, such as modularized structure, easy to disassembly, regenerated materials, avoiding hazardous substances, lean packaging, and final product recycling. The objective of this research is to apply the voting analytic hierarchy process (VAHP) to green product design and alternative evaluation for 3C industry. Green product design related literature was first reviewed to screen adequate criteria and expert interview was performed for confirmation. The evaluation process was then constructed based on the confirmed criteria. A systematic process was built for 3C product designer to select an optimal design alternative. The findings of this research are as follows: (1) Five main considerations in green product design were material selection and management, product assembly and disassembly, product recycling, design sustainability, and package deduction, containing 17 evaluation criteria. (2) With the aid of VAHP, weight of each criterion was calculated to present the priority of criteria. (3) An evaluation form consisting of green criteria and weights was developed to facilitate the product design process.

Keyword：Green Product Design, Alternative Evaluation, Voting Analytic Hierarchy Process (VAHP)