The Study of the Design of Green Assembly and Disassembly

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ABSTRACT

The advanced technology and information have helped most of people ’ s dreams become reality. But the price has been paid dearly: this planet is facing the worst nightmare ever—abrupt climate changes, the deterioration of the earth quality, and the serious air pollution. People now are overexploiting the planet and taking the next generation the right from living comfortably and healthily. The inappropriate manufacturing, producing, use and disposal of industrial products are, without doubt, the main causes of the globally environmental deterioration. As the design of a product is the beginning of the product life cycle, when the ideas of environmental protection are put into the very first stage of design, the environmental pollution caused by the product can be minimized across life cycle. Notebook personal computers are being investigated in this study in the hope of shedding light on the design of green (environmental or recycling friendly) assembly and disassembly. According to the Institute for Information Industry (Nov. 21, 1997), the annual production of Taiwan information industry has reached US$30,000,000,000, next to the United States and Japan only. It is estimated that by the year 2000, notebook personal computers will be the biggest exported item here in Taiwan. Being such a gigantic industry, notebook personal computers will have tremendous impacts on the environment if they are not designed environmental or recycling friendly. According to Life Cycle Assessment criteria of ISO 14054 and ISO 14060, products are required not to damage the environment across the raw material-design-manufacturing-use-disposal-recycling cycle. This case study is based on a well-known notebook personal computer manufacturer in Taiwan. The green assembly factor in this study is operated by investigating its factory workers and design engineers at work; the green disassembly factor is performed by examining its maintenance people at work for its lack of the professional in charge of disassembly and recycling. The investigations were conducted based on problem solving and open ended questionnaires were offered; unusual assembly problems were also examined. An evaluation criteria for green assembly and disassembly were set and the software of Microsoft office 97 was adopted for analyzing the data. Many forms were made concerning the design of green assembly and disassembly. To avoid the factor of subjectivity, the evaluation criteria for green assembly and disassembly has been set according to the literature presented in this study, and the evaluation charts have been made as criteria for green design for computer products. The result of this study helps examine systematically whether product designs meet requirements of environmental protection and is able to help examine if designs fit in green assembly and disassembly criteria. This study also tries to make some suggestions for future designs of notebook personal computers.

Keywords : green design

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