

Enhancing the eco-innovation effects by TRIZ and QFD

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## Abstract

Failure modes and effect analysis (FMEA) is a quality improvement and risk assessment tool commonly used in industry. It is a systematic process for identifying potential design or process failures in advance, and then to minimize even eliminate the risk. TRIZ is a Russian acronym meaning "Theory of Inventive Problem Solving". It defined inventive problems as those which contain conflicting requirements, which it called 'contradictions'. In TRIZ methodology that it defined 39 basic properties and 40 principles for solving problems containing contradiction in any two-of-39 properties. It gave in the form of a contradiction table of size 39 x 39 with each cell giving up to 4 principles that may be used to eliminate the contradiction. Kano's model illustrates the relationship between customer satisfaction and product performance. Understanding the category of the quality elements is beneficial in improving the quality management: one can select different strategies for different qualities and focus on priorities for product/service development. In traditional FMEA, Corrective actions quite often have not been considered to the state that the aggravation condition of subsystem, furthermore, Severity rates are usually determined only with respect to the views of the designer but ignore the view of customer. This paper provides a novel approach to overcome these limitations. Through this research, not only can avoid that subsystem may produce the situation of the conflict as FMEA in the design process but also the

“risk priority number” (RPN) determined would involved customers’ view from KANO model concept.

Keyword : Failure mode and effect analysis, Kano’ s model, risk priority number