An evaluation framework for technology transfer of new equipment in high technology industry

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Abstract

With the rapid transition of industrial structure, product life cycle is shortening continuously. In order to compete against other firms in the fierce market, a firm has to keep developing new technology to differentiate itself from others. The installation and operation of new equipment is an outcome of new technology development, and only then can the manufacturing capacity and competitive edge be increased. For the capital investment in production, the acquisition of new core-technology equipment should be treated as the first priority. In addition, the technology know-how of the equipment must be transferred completely from equipment supplier to engineers and operators of the firm, so that the equipment can be utilized effectively and the company profit can increase substantially. Therefore, a proper evaluation and selection of new equipment with critical technology transfer is essential for the firm to gain its competitive edge. The objective of this paper is to explore the technology transfer of equipment and to establish a comprehensive evaluation framework by considering critical influence factors. Influence factors for technology transfer of new equipment are first collected by literature review and interview with related experts in the thin-film transistor liquid-crystal display (TFT-LCD) industry in Taiwan. Fuzzy Delphi method (FDM) is applied next to select the most critical factors. Then, interpretive structural modeling (ISM) is employed to determine the interrelationship among the critical factors. A fuzzy analytic network process (FANP) model is constructed to evaluate the technology transfer performance of equipment suppliers. A case study is presented to examine the practicality of the proposed framework. The results of this study should provide a base for firms in evaluating the purchase of new equipment and a reference for equipment suppliers to strengthen their

technology transfer process to their buyers.

Keyword：Technology transfer, buyer-supplier relationship, knowledge management, fuzzy Delphi method (FDM), interpretive structural modeling (ISM), fuzzy analytic network process (FANP)