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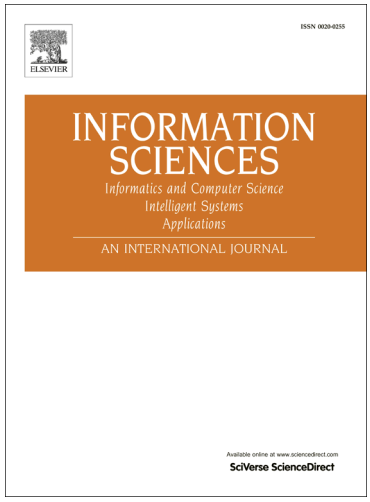

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Elim Liu, Shih-Wen Hsiao, Shih-Wei Hsiao

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A Decision Support System for Product Family Design

Elim Liu[a] , Shih-Wen Hsiao[b] *, and Shih-Wei Hsiao[c]

[a]Department of Information Communications, Southern Taiwan University of Science and Technology, Tainan, Taiwan 71001, R.O.C.

[b]Department of Industrial Design, National Cheng Kung University, Tainan, Taiwan 70101, R.O.C.

[c]Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan 70101, R.O.C.

Abstract

Developing a product family under a robust platform provides a company with an important competitive advantage. The competitive benefits include reducing engineering costs and time to market, extending product portfolios and expanding market share. This study illustrated a design methodology using two decision techniques for achieving optimal product architecture. The analytic network process (ANP) is first employed to incorporated designers' knowledge in calculating relative importance of components regarding to customer needs. The goal programming approach that incorporates the result of ANP and cost budget limitation then is applied to determine the platform and also the variant components to be focused on redesign. The drivers of variances of components are further investigated to ensure the redesigned parts meet the requirements of specialized niches in the segment markets. Finally, a product family design example is used to illustrate the application of this methodology.

* Corresponding author. Tel.: +886-6-2757575 ext 54330; fax: +886-6-2746088

E-mail address: swhsiao2002@yahoo.com.tw (S-W. Hsiao).

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