

December 1998

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Rolf Wigand
University of Arizona

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Recommended Citation

Wigand, Rolf, "Toward Integrated Fuzzy Front-end Decision Support Systems for New Product Development" (1998). *AMCIS 1998 Proceedings*. 416.
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Toward Integrated Fuzzy Front-end Decision Support Systems for New Product Development

Divakaran Liginlal

Department of Management Information Systems
University of Arizona

Innovation and new product introduction have become key challenges facing companies entering emerging markets. Most of the existing quantitative or economic models proposed for New Product front-end decision making are deficient in the way they handle the decision maker's subjective judgment, while the empirical ones are constrained by the need for gathering field data for diverse business types. Expert systems that have been proposed are limited in scope due to the difficulty involved in capturing rules from experts for each business situation and deficiency in handling uncertainties. The emerging paradigm of soft computing combines heuristics, powerful optimization algorithms and learning techniques, to realize analytically sound systems that also capture the human subjectivity in decision making. Fuzzy measures exemplified by the Dempster-Shafer belief measures and the possibility measures of Zadeh are now being increasingly accepted by researchers as powerful tools for semantic modeling and uncertainty representation. The aim of this dissertation is to develop a fuzzy measure theoretical model of new product screening, translate the conceptual model to an executive decision process model and use fuzzy rule bases and fuzzy inferencing to derive business strategies from expert evaluation of critical success factors. New product managers of several American firms whom we interviewed have been receptive to the idea of testing a prototype of the proposed system to aid in their business decisions involving new product development. We intend to validate the prototype in a real business setting involving decisions to launch telecommunication products on a global scale.

Acknowledgements

This dissertation work is being carried out under the guidance of Dr. Sudha Ram, Professor, Department of Management Information Systems, University of Arizona, Tucson, AZ 85721, U.S.A. (email : ram@bpa.arizona.edu)

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