Applying Fuzzy Theory in the Optimization of the Decision Making Process

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ABSTRACT

Decision analysis plays a key role in the corporation ’ s sustainable development; the success of business projects is also affected directly or indirectly by the quality of decision-making. There is no doubt that information technology increases the efficiency in workflow, resource allocation, and etc, However the results of applying information technology in decision-making improvement to augment competitiveness are not as good as expected. The failure of decision-making usually results from the difference in recognition and misunderstanding of problems. Finding the solutions that help decision makers to correct inadequate procedures is one of the most popular research topics nowadays. Because of the shifting business environment causing the increase of difficulty and complexity in problems, Management Information System cannot provide effective solutions for situations such as having inaccurate evaluation for cases with few data, and existing recognition differences about questions among interviewees. Therefore, what improvements we should have in management environment are to effectively integrate advanced information technologies with appropriate decision-making models to improve the analytical and predictable capacities of management information system, and to augment competitiveness of enterprise. The goals of this research are to solve above problems by providing dependable methods to decision makers, and to find a reliable evaluation basis. The best solution of optimizing the decision-making process proposed by this research is the Fuzzy Decision Analysis that combines Grey Relational Analysis, Fuzzy Analytical Hierarchical Process, and Coefficient of Variation. Through the hierarchical structure, the proposed methods are, first, to collect “ questionnaire statistics ”, “ professional opinions ”, and etc… and then to conduct a “ Fuzzy Decision Analysis ”. This solution allows decision makers to modify procedures through Coefficient of Variation to predict standard deviation. The significant results are: the efficiency will arise; the costs will lower; and the needs of optimizing decision-making will be satisfied.

Keywords : Grey Relational Analysis, Fuzzy Analytical Hierarchical Process, Coefficient of Variation, Decision Support System.

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