Economic Feasibility of Projects Using Triangular Fuzzy Numbers

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Abstract

The feasibility analysis of projects is an indispensable process for software development organizations. The intangible nature of software and the multiple criteria considered, introduce uncertainty in this process. This article proposes a method that uses triangular fuzzy numbers to evaluate traditional economic criteria Net Present Value, Internal Rate of Return, and Period of Recovery of Investment; which provides higher flexibility and certainty in the prediction. The article also presents the definitions of fuzzy economic criteria and discusses some variants for different cash flows. The proposal allows treating the variations that may occur during the life cycle of the project. The final value of the criteria is obtained by considering three possible scenarios: pessimistic, more accurate and optimistic. The proposal was applied experimentally, in 30 finished software projects. The target was to determine if there were significant differences in the order of feasibility of the projects, comparing the results obtained by the fuzzy economic criteria with those obtained by the traditional economic criteria. Significant differences were found in favor of the fuzzy economic criteria Net Present Value and Internal Rate of Return. Better results were achieved by fuzzy Period of Recovery of Investment, but, the difference was not statistically significant.

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