IMPLEMENTATION USING TRAPEZOIDAL FUZZY NUMBERS FOR FINDING THE CRITICAL PATH IN FUZZY PROJECT NETWORK

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Abstract

In planning and scheduling of a large scale project, it is difficult to predict the optimal completion time of the development. Critical Path Method (CPM) has become a common method used to predict the time in planning and scheduling a project. But, the technique is less effective because it only considers a definite duration to finish the project. Therefore, it requires an application that is able to facilitate the planning and scheduling of the project if the process is a fuzzy number which means, that the duration is uncertain how long it will last.

In this final project, developed an application that aims to get the critical path in the activities within a fuzzy project network in planning and scheduling process. Where the critical path shows some activities that can not be postponed so the optimal time to finish the project can be obtained. The method used is CPM with a defuzzification on trapezoidal fuzzy numbers. The defuzzification is applied to a slack time in each activities. So from this process will be obtained the criticality level of each activities in a fuzzy project network.
The dataset used in the testing are numbers of nodes, origin node, destination node and the duration of each activities. The dataset is stored in a file .cpm or users can directly enter data manually in the application. The results show that the defuzzification is able to provide accurate results in determining the critical path in a fuzzy project network, when the duration is trapezoidal fuzzy number.

**Keywords:** Critical Path Method, Trapezoidal Fuzzy Number, Fuzzy Project Network, Defuzzification.