D-SUB: Decision Support System for Subcontracting Construction Works

Abstract:

Letting work to subcontractors is a very common practice in construction industry. Subcontractors help contractors overcome problems including the need of special expertise, shortage in resources, and limitation in finances. The decision to subcontract involves designating work items to be subcontracted and making assignments to subcontractors. Generally, work assignments to subcontractors can be for the total quantity of a work item or a proportion thereof. This paper presents a decision support system that makes assignments to subcontractors of the work items designated for subcontracting. Moreover, the system calculates and plots the overdraft profile based on the financial terms of the contract and project schedule. The ultimate goal of the system is to make work assignments to subcontractors under constraints economical and predict the expected profit at the end of the project. The system encompasses four basic components including project data, linear programming module, sensitivity analysis module, and financial analysis module. The sensitivity analysis adds strength and flexibility to the system by allowing the user to experiment with different scenarios. Finally, the developed system that represents a structured method for making subcontracting decisions is demonstrated through an illustrative example project.