Abstract

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Concrete Pouring Production Rate Estimation: A Bayesian Network Approach

Production rate estimation is important at the planning stage to provide adequate project schedule and cost prediction. Most production rate estimation tools in the construction field are empirical and require adjustments to fit any specific construction company. Moreover, the existing tools do not account for the stochastic nature of construction crews and their interdependencies that impact their production rates. The purpose of this paper is to present a generic statistical-based model that utilizes site specific data for accurate production rates estimation. The presented model utilizes Bayesian statistics that is commonly recognized for reasoning in stochastic environment. The authors developed the model for concrete pouring activities. The required data was gathered through site observations to determine the probability distribution function for parameters affecting the production rates of construction crews. The proposed model was tested against actual concrete pouring activities in a construction site and provided adequate estimates for the activities' production rates. The modeling approach is transformable and can be applied to various other activities in the construction field based on the heterogenic and stochastic properties of the construction crews and site conditions.