

Incentive modeling analysis in engineering applications and projects with stochastic duration time

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ABSTRACT

Incentives are quite common to be utilized in engineering applications such as some infrastructure development projects or construction projects. Due to the increasing complexity of construction management and the continuing trend towards outsourcing of component or engineering outsourcing activities, we focus on the issue of incentive design. Time collaboration is one of the main focuses of random project duration time in parallel projects. In this article, we consider a setting where a manufacturer outsources two parallel subtasks to two different suppliers, and the manufacturer is time sensitive. On the premise that the project completion time follows the exponential distribution, some models are established to compare the proposed incentives and we get the comparative analysis of the proposed incentives. This paper puts forward three kinds of time-based incentive mechanisms, namely, deadline incentive mechanism, competition mechanism and mixed incentive mechanism. We do modeling analysis for all incentive mechanisms. We get the optimal work rates determined by suppliers and compare various incentive mechanisms to maximize manufacturers' profits.

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