

SIMULATION MODEL FOR DETERMINING MAINTENANCE STAFFING IN HIGHER-EDUCATION FACILITIES

ABSTRACT:

Expeditious repair of the unpredicted breakdown of the systems' components of facilities is a crucial demand that is being highly conducive to the users' convenience and systems' longevity. Determination of maintenance staffing, particularly the number of maintenance crews, constitutes a key decision in this regard. Judicious determination of the number of crews avoids crews being under-utilized or overloaded. A simulation model, using AweSim simulation language, was developed to determine the optimal number of crews for a maintenance department of a large higher-education facility. The model development involved; Establishing statistical distributions that reflect the stochastic nature of the generation of the repair requests as well as the service times; Setting up the maintenance service model that defines the logic, sets priority for the assignment of repair requests to crews, and defines performance measures; Developing the simulation software; and Collecting statistics of the performance measures for scenarios that represent different number of crews and crew-loading policies. The optimal number of crews was identified as being the scenario of the least total of the operating costs incurred by the maintenance department and users' inconvenience costs. Finally, the model represents a robust management tool for long-term economical planning of resources.