Predicting the Delivery Time of Public School Building Projects Using Nonlinear Regression

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ABSTRACT

The delay in delivering public school building projects in Iraq is one of the major problems that face the construction of new school buildings. In order to enable the concerned governmental agencies to predict the expected delivery time of these projects at the time of contract assignment, two forecasting models are developed to aid in this matter. After reviewing a wide range of literature to determine the most common causes of delay, a questionnaire is distributed to owners, consultants, supervising engineers and contractors engaged in public school building projects. The results of the questionnaire were analyzed using the relative importance index. Nine most important causes of delay in public school building projects were assured by the respondents namely; the contractor's financial status, delayed interim payments, change orders, contractor rank (classification), work stoppages, contract value, experience of the supervising engineers, contract duration and delay penalty. Historical data concerning these causes was extracted from past records of the General Directorate of School Buildings, then nonlinear regression was employed to develop two models (A & B) that can predict the final delivery time of public school building projects having (12) and (18) classes separately, where the Levenberg-Marquardt technique was used to develop the mathematical equations. The developed prediction equations show a degree of average accuracy of (97.79%) for schools having (12) classes and (97.11%) for schools having (18) classes, with (R^2) for both NLR models of (81.25%) and (87.58%) respectively.

Keywords: Delay, Delivery Time, Nonlinear Regression, School Projects.