

Construction Unit Rate Factor Modelling Using Neural Networks

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Abstract : Factors affecting construction unit cost vary depending on a country's political, economic, social and technological inclinations. Factors affecting construction costs have been studied from various perspectives. Analysis of cost factors requires an appreciation of a country's practices. Identified cost factors provide an indication of a country's construction economic strata. The purpose of this paper is to identify the essential factors that affect unit cost estimation and their breakdown using artificial neural networks. Twenty-five (25) identified cost factors in road construction were subjected to a questionnaire survey and employing SPSS factor analysis the factors were reduced to eight. The 8 factors were analysed using the neural network (NN) to determine the proportionate breakdown of the cost factors in a given construction unit rate. NN predicted that political environment accounted 44% of the unit rate followed by contractor capacity at 22% and financial delays, project feasibility, overhead and profit each at 11%. Project location, material availability and corruption perception index had minimal impact on the unit cost from the training data provided. Quantified cost factors can be incorporated in unit cost estimation models (UCEM) to produce more accurate estimates. This can create improvements in the cost estimation of infrastructure projects and establish a benchmark standard to assist the process of alignment of work practises and training of new staff, permitting the on-going development of best practises in cost estimation to become more effective.

Keywords : construction cost factors, neural networks, roadworks, Zambian construction industry

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