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Faculty of Engineering

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Predicting the Earned Value for Tunnels Projects Using Artificial Neural Network Approach

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AUTHORIZATION FORM

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Abstract

Earned Value Management (EVM) is a project management methodology that integrates scope, schedule, and cost. It is a framework that allows project management professionals to monitor these three components so they have an objective measure of project health. The goal is to optimize subjective progress measurement.

There may be a weakness in earned value management for the tunnels projects because the current available techniques are poor and uncertain. However, today a great deal of effort is focused on the development of neural network for predicting the EVM in construction Projects generally, and tunnels projects especially.

The main objective of this study is to introduce Artificial Intelligence (AI) in conducting statistical approach for earned value management of the tunnels projects. Methodology is mainly depended on the determination of various factors that affect the EVM of the tunnels projects, that involves historical data in Iraq and Jordan.

five independent variables were randomly selected (Actual Cost AC, Planning Value PV, Earned Value EV, Actual Duration AD and Planning Duration PD), which were well defined for each tunnel project, and one

dependent variable Schedule Performance Index (SPI) was selected.

Neuframe Program was selected, which is the premier neural network simulation environment. The procedure adopted for finding the optimal network architecture and internal parameters that control the training process which carried out by using the default parameters of the Neuframe software package.

The experimentation results reveal that, Mean Absolut Percentage Error (MAPE%) and Average Accuracy percentage (AA%) generated by ANN model (SPI) were found to be 11% and 89% respectively. Therefore, it can be concluded that ANN model (SPI.model.1) shows an excellent agreement with the actual measurements.

Content

LIST OF FIGURES

LIST OF TABLES