

# A STUDY ON FACTORS AFFECTING ESTIMATION OF CONSTRUCTION PROJECT: CONCLUSION

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**Abstract** - Construction industry could be considered as a very important sector for development all over the World and the construction cost estimation is the most important element in it. Realistic estimation of construction cost is vital for both successful planning and completion of every construction project. The key factor in a project's success is the accurate cost estimation at its early stage. It is difficult to quickly and accurately estimate construction costs at the planning stage itself when project information is limited. This study aim at carrying out to identify the factors affecting construction cost estimation. The factors were identified based on questionnaire survey. Questionnaires were given to 64 experts in the construction industry aims to determine the importance of construction cost estimation and to determine the score of each factor. Statistical analysis will be carried out on the feedback of the respondents of the survey. RII value of the factors to be found using Microsoft Excel. The mean score of each factor to be determined and the p-value was calculated using the SPSS software. The significance of each factor used in the questionnaire to be determined. The significant factors were identified using the mean score and their p-value.

**Key Words:** Cost Estimation, Artificial Neural Network Model, Design-bid-build projects.

## 1. INTRODUCTION

Many factors affect accuracy of construction projects cost estimating. Through this study, factors affecting cost estimation of building construction projects are discussed. Design-bid-build projects (DBB), either executed by governmental or private companies and selected in an open tendering are selected for the scope of this study. The construction cost estimate is a prediction and foreseeing of the total cost of a construction project before it actually exists. Several estimation methods are used in construction practice and the suitability of any particular method is usually dependent on the purpose it is used for, the amount of information available at the time of estimation, and the party using it. Despite the reliance of clients and contractors on available cost estimation and forecasting methods, the actual final costs of construction projects still considerably deviate from their original estimates.

The major objectives of the study could be listed as follows:

- i. To explore the existing common practices in cost estimating.
- ii. To identify the significant factors affecting the construction cost.

The need to solidify the estimation process can be seen in four areas:

1. State financial plan
2. Creation of public satisfaction and a positive response
3. Project control
4. Problems currently being encountered.

## 2. METHODOLOGY

### 2.1 General

Construction is well known for its uncertainties, so that uncertainties seem to be the only necessity in this field. In such context, one major process which promises to reduce the uncertainty and make the construction process more efficient and cost effective has made its advent in India in the recent past.



Fig 2.1 Research Methodology

### 3. DEVELOPMENT OF ARTIFICIAL NEURAL NETWORKS MODEL

#### 3.1 General

The objective of this chapter is to develop a decision support tool that can help the contractor to identify the expected cost variance. Hence, a decision can be made regarding the expected contingency that should be added to the base estimate. This chapter is slanted to shed a great deal of light on the sequences of the proposed neural network model development. General view on learning process, training network concept, trial and error practices, neural connection software, model training and model testing will be presented.

### 4. CONCLUSION & RECOMMENDATION

#### 4.1 General

The research study is presented in six chapters encircling the whole research essence. This Chapter, which presents the summary of the study, ultimately reveals the digest of major findings drawn from the study. The research findings are presented while considering the final model, and their interpretations are also briefly mentioned. The chapter also cites the appropriate current recommendations, which the researcher developed based on the conclusions of the research study. Some recommendations for further studies in the same area are also presented and suggested according to the perception of the researcher.

#### 4.2 Summary

Cost estimating is an assessment of the expected cost of any construction project. The accuracy of such estimate has a serious effect on the expected profit of the construction contractor. Hence, a certain contingency premium should be added to the base estimate to increase the level of confidence. Such premium is materially affected by many factors. Through this study, the main factors that are expected to affect the accuracy of the construction project cost estimate are clearly identified. Cost variance is used as an indicator of the cost estimating accuracy. The most important factors identified are twelve factors. These factors are: economic instability, quality of firm's project planning and management, relevant experience of estimating team, availability of management and finance plans, ability of estimating team, labor and equipment required, estimating method, project location, periodical payments, accuracy of bidding documents provided by client, competence and leadership of project manager and impact of the accuracy of project schedule (expected delay). Pertinent cost data of a selected sample of construction projects are investigated to find out the effect of these factors on the construction project cost variance. Finally, a neural network model was developed that can greatly help to assess the expected cost variance of any future construction project. The validity of

the proposed model was tested to confirm that the model can assess the expected cost variance at a satisfactory level of accuracy.

#### 4.3 Research Conclusions

The following conclusions are drawn from this research:

1- Through literature review, potential factors that affect the accuracy of the cost estimating for construction projects were identified. Twelve factors are identified. These factors are: economic instability, quality of firm's project planning and management, relevant experience of estimating team, availability of management and finance plans, ability of estimating team, labor and equipment required, estimating method, project location, periodical payments, accuracy of bidding documents provided by client, competence and leadership of project manager and impact of project schedule.

2- Measurements of the twelve factors show that improvement of the quality of firm's project planning and management, relevant experience of estimating team, availability of management and finance plans, ability of estimating team, availability of labor and equipment required, estimating method, project location, periodical payments, accuracy of bidding documents provided by client and competence and leadership of project manager can greatly reduce the average cost variance. While economic instability and impact of project schedule "expected to delay" are found to have a bad effect on the average percentage of cost variance.

3- A satisfactory neural network model is developed through eighty experiments for predicting the average percentage of cost variance for any future building construction projects. This model consists of one hidden layer with twelve hidden nodes with a sigmoid transfer function. The learning rate of this model is (0.07), while the training and testing tolerance are set to the same value. Testing the validity of the proposed model shows that the model can assess the expected cost variance of any construction project at an average accuracy of about 80%. However, with the availability of more cost data in the future, such accuracy can be greatly enhanced.

#### 4.5 Recommendations:

It is recommended for construction parties to take the twelve factors that may severely affect building construction cost variance as mentioned in this study into consideration when preparing cost estimate for any future project as follows:

[1] Consider economic instability and project location when defining contingency value.

[2] Assign qualified project manager, estimating team and planners.

[3]Applying good management and finance plans.

The following potential areas of studies, if explored, would provide increased validity to the findings of this research:

[1]The model should be augmented to take into consideration the other different types of construction projects. For example: The infrastructure construction projects and heavy construction projects.

[2]The development of artificial neural network models or any other technique requires the presence of structured and well-organized database of the completed projects in construction firms.

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