EXPERT SYSTEM ON MARK - UP SIZE DECISION IN COMPETITIVE BIDDING

BY

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Declaration

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To my Parents
for their endeavours.....

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Oct 2005 *G R S Pathirana*

Abstract

In line with the advancement of society, the construction industry with no exception, has been upgrading rapidly. As the contributors to the construction industry raises the complexity of the industry too raises demanding us to explore and analyze the industry with much needed attention. The bidders who can cope up with the competitive nature of the bidding only will survive. Therefore it is very much in importance to have a bidding strategy, which leads to win- win situation to both the client and the contractor.

The critical early analysis of factors affecting the mark- up size decision for any given project plays a vital role.

The contractors' behavior of bidding affects by a large number of factors which ranging from the construction company characteristics (internal to the company considered) to Macro Economic environment (society at large) including the project specific characteristics.

In this context the bidding decisions are of highly complex, unstructured where clear guidelines are difficult to set up. The decisions on bidding will be usually made based on the intuition and experience of the domain experts. The aim of this exercise is to develop a Knowledge Based System (KBS) to help the contractors to streamline their attention on to most critical factors identified, which are affecting bidding decision and to suggest a reasonable range of mark up size for a given project under specific context.

There were ten important factors selected through intensive literature review; Availability of Projects, Need for work, Owner Client relation, Past profits in similar projects, Rate of return in investment, Experience in similar projects, Cash flow (negative), Current work load, Competition, and the KBS was developed using the Fuzzy logic tool box on Matlab platform.

This KBS enables the decision makers to evaluate the impact of said factors on a specific bid situation. Given the subjective nature of the mark up size decision the Fuzzy set theory, which is a sub branch of Artificial Intelligence (AI), enables the assessments to be arrived in qualitative and approximate terms. Seven decision rules were constructed based on the expert comments. Seven sets of data analysis were carried out in this system.

The quality of information and awareness of the decision on mark up size of a particular tentative project that can be gained from this model may help the construction companies to obtain a competitive edge in bidding.

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