Expert system for approximate estimating of rehabilitation cost of war damaged schools in the north and east

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Rehabilitation is one of the current topics spoken everywhere in the world. Lot of countries, which have been in war for several years are being considered for rehabilitation with multi-nations' interferes, as they are starting to move into a normal situation. Aid agencies and governments always look for estimated cost figures for such rehabilitations to make their decisions on allocation of funds. These estimates are very superficial but still should be closest to the actual cost after completion. Thus, it has become a paramount need for construction experts, who are coming for estimating on behalf of aid agencies, to prepare a reasonably accurate preliminary estimate without having adequate details. However, they do struggle to prepare such an effective report at the present of the followings:

- Doing a thorough and in-depth analysis on war damages of structures, and to prepare a cost estimate using traditional methods is extremely time consuming;
- Getting precise data for analysis from those places is almost impossible. Uncertainty and vagueness always inherits those set of data; and
- Problems in proper cost analysis from past data of similar structures using traditional methods like unit method, area method, cube method or elemental analysis method. Because, it is very difficult to match damaged part of structures with new structures.

These issues lead to inaccurate cost estimates by experts. Thus, there is a need to identify a new methodology to tackle it and provide good preliminary estimates for the renovation of war damaged structures. This situation was very pertinent to Sri Lanka when the World Bank wanted to prepare a report on the needs assessments of schools in North and East provinces, which includes an approximate estimate of cost for repairing the damaged buildings, to present the multi-national donor conference in Tokyo.

Fuzzy logic based expert systems were identified to tackle the problem of this nature. Such a system will help experts to get rapid cost estimates for school buildings by giving their perceptions on the degree of damage to elements. That is, by observation experts can rank the degree of damage from 0 – 100 % to elements like roof, walls, floors etc. Then they can feed these percentage figures into the system and get a cost estimate to repair this damage. This methodology can be extended to obtain approximate cost estimate for the repair of structures like roads, bridges, drainage etc in war damaged places, irrespective of the location.

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