

UNIVERSITI TEKNOLOGI MARA

**A KNOWLEDGE BASED EXPERT
SYSTEMS BASED UPON WEBGRID-III**

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ABSTRACT

Since the construction industry still lacks a strong Information Technology (IT) approach, especially in the bidding and tendering domain, the objectives of the thesis were to study the pattern of the experts in the bidding and tendering area in selected departments of Malaysia Airlines. The focus would be those who were making decisions not only from an IT perspective, but also from sociological and psychological perspectives.

Besides that, the study was also carried out to confirm whether their decision making exercise could be automated to assist and structure the process. The outcome of the study is to propose an Expert System Prototype to the experts, that contains a knowledge based system which has rules (logic program) based on their cognitive perception on how to select bidders.

Fifteen experts from four different departments were involved in this study, using the Repertory Grid methodology, from where their knowledge was elicited, analyzed, represented and modeled as a rule based system, embedded in the prototype, called AdjuComm. The prototype was developed on the WebGrid-III Expert System tool (software) which originated from the University of Calgary, Canada and is freely available on the internet. Using the tool, people's views or opinions could be weighted or measured and their construct pattern could be analyzed.

The finding of the study shows that the developed prototype (AdjuComm) could pattern the experts' cognitive perceptions, especially when dealing with human cognition of bids, and be able to minimize bias. The study also shows that the WebGrid-III could be used as an important tool for developing knowledge based expert systems due to its efficiency, scalability, accessibility and flexibility.

As a part of the range of Knowledge Based Expert Systems, The AdjuComm could accept vague (blank) data within certain limits, and it is suggested that certain improvements can be added to the prototype in the future, based on the requirement to make it more advantageous and beneficial in the bidding domain.

To ensure the efficiency and flexibility of the prototype, different categories of experts were invited to verify and give comments on the prototype. Their feedback and views were important in order to justify and enhance the prototype scalability which could be described as 'initially successful'.