

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**THE APPLICATION OF INTERVAL-VALUED INTUITIONISTIC
FUZZY ANALYTIC HIERARCHY PROCESS TO SOLVE
CONTRACTOR SELECTION PROBLEM**

P32S19

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ABSTRACT

In the manufacturing companies, a contractor company plays a critical role in repairing and the operation of the equipment. It is very important for businesses to choose a professional contractor to carry out the maintenance project in order to run their businesses smoothly. Nonetheless, it is a difficult problem since the choice of contractors is generally a question of multi-criteria group decision-making involving multiple competing parameters on which the information of decision-makers is normally ambiguous and imprecise. This paper used the method of Interval-Valued Intuitionistic Fuzzy Analytic Hierarchy Process (IVIFAHF) to solve contractor selection problem, making a comparison of the result with Analytic Hierarchy Process (AHP) method and the sensitivity were analyse in decision making which results in the selection of the potential contractor. To improvise the lacking in AHP method, the developed IVIFAHF method offers a more accurate judgment as it takes the importance of the Decision Makers (DMs) and also the uncertainty associated with the process of making the decision. Data were collected through an interview with a company's representative and a set of questionnaires was distributed to DMs. Five criteria consist of price incurred in maintenance project (C₁), past performance of the contractor (C₂), technical skills (C₃), availability (C₄) and financial stability (C₅) of the contractor are taken into consideration in order to choose a contractor from a list of alternatives (A₁, A₂, A₃ and A₄). According to the criteria preferences, the most preferred contractor, A₄ has come up as the first alternative to be chosen compared to the other three alternatives. Besides that, by applying the sensitivity analysis in this study, the technical skills (C₃) is the criterion that has least differences between actual relative weight and approximate relative weight after reducing other criteria. Eventually, IVIFAHF method are more preferable than AHP method because it includes the degree of importance of DMs and deals with the vagueness and uncertainty of the human judgement in the process of selecting the best contractor for the company.