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FINAL CONTRACTOR SELECTION USING THE POINT'S METHOD

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ABSTRAT: The *evaluation and selection of contractors leading to the award of contract is a vital part of the construction process. In particular, construction contracts evaluation based on the price only is not an effective method as it influences the project's quality. In effect, a number of factors need to be taken into account when making the contractor selection decision. The research in hand utilizes the point's method to assist construction clients in identifying contractor with the best potential to deliver satisfactory outcomes. The required data was obtained from real life case study for contractor selection considering factors related to quality and price.*

KEYWORDS: Contract award, Contractor selection, tendering evaluation

INTRODUCTION

Contractor selection is the process of choosing the most appropriate contractor to execute the project under consideration. In essence, it is considered a crucial part of the construction process as it affects the progress and success of any project. Awarding construction contracts based on the bid price as the main criteria could influence the contractor's pricing as contractors may tend to use cheaper, lower quality materials, using insufficient materials, and taking serious health and safety risks on jobs to ensure greater profits. This is why the client has to take other criteria into account when evaluating the submitted bids and not to award the contract based on the lowest price only.
This paper presents a point method as a mean for evaluating different tenders taking into account both price and quality factors. This method is applied to a real life case study for Contractor Selection.

A LITERATURE REVIEW:

There are three distinct stages in the competitive tendering procedure leading to a final agreement between the client and contractor:

- Advertising the proposed project: Promoters normally advertise the proposed project in the local and trade publications to encourage qualified contractors to participate and submit an offer to undertake the work.
- Submitting Offers: the submission of offers by interested and qualified Contractors to undertake the proposed project.
- Bid Evaluation, consideration and acceptance of the offer: the promoter evaluating each bid and selecting the best bid leading to a contract between the promoter and one of the tenderers.

Construction clients are becoming more aware of the fact that the contractor selection based on bid price as the sole criteria is risky and may lead to project failure of the project.
Many researchers emphasizing the importance of contractor selection suggest various selection models for contractor evaluation.

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Yawei, et *al.* (2005) employed an approach called the Multiple-layer Fuzzy Pattern Recognition (MFPR) to contractor selection problem. The pair-wise comparison method was used to decide relative membership degrees of qualitative criteria as well as weights of the criteria set. The feasibility of this approach was illustrated by including a case study for a channel construction project. The outcome from this paper revealed that the MFPR may assist in contractor selection decision-making process, as it can deal with different opinions in order to reach a decision. Meanwhile, Hatush and Skitmore (1998) presented the Utility Theory as a multi-criteria technique for contractor selection. Twenty four factors were taken into account and were categorised into six groups: the bid amount, the financial soundness, the technical ability, the management capability, the health and safety records and reputation. A hypothetical case study where five contractors are bidding for a multi-story building project was illustrated in this paper. Interviews with four leading professionals involved in contractor selection were conducted to assign utility values to different criterion in order to build the utility functions. The results showed that the bidder with the lowest price was ranked third which indicates that the other factors need to be considered when making the contractor evaluation. An alternative contractor selection model using the analytical hierarchy process (AHP) is suggested by Mahdi et *al* (2002) and Topcu (2005). Furthermore, Watt et *al.* (2010) identified and classified criteria employed to evaluate bids and contractors' selection among Australian employers. Using questionnaire survey, categories were marked as working capacity, financial status, health, safety and the environment, key personnel of the company location, skills in project management, social and political standards, organizational experiences, performance in previous projects, company reputation, offered price, quality control, employer and contractor relationships, technical skills and the proposed method.
In addition, Chaghooshi et *al.* (2014) aimed at identifying important criteria for contractor selection, determining the significance of the criteria, and designing a framework for selection of the most appropriate contractor. Six criteria were selected and their weights were determined by the application of goal programming. Finally, contractors were ranked and the best contractor was selected using fuzzy ELECTRE technique with trapezoidal fuzzy numbers.

PROCEDURE FOR POINTS METHOD OF EVALUATION:

Tenders were assessed on the basis of quality and price and must remain valid for 90 days. The tender must be submitted in two parts, comprising a ' Quality Submission' which should be contained in Envelope A and a ' Financial Submission' which should be contained in Envelope B. The envelopes are to be clearly marked 'A' or 'B' and the name(s) of the Tenderer(s) is to be clearly marked on the outside of each.

Quality and Financial Submission

Envelope A (Quality Submission)

Envelope (A) contains statements in response to the questions related to General Scheme Management, Design Phase and Construction Phase, under the headings listed below.

General Scheme Management

- Overall Approach, Methodology and Programme
- Innovation and Continuous Improvement Strategy
- Public Relations
- Risk
- Target Cost and Activity Schedules
- Open Book Accounting

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- Quality and Key Performance Indicators
- Staff for the Project
- Approach to Partnering

Design Phase

- Estimate of Time Based Hours for Works in Design Phase
- Environmental Impact Statement
- Environmental Data Requirements
- Design Development
- Compulsory Purchase Orders
- Oral Hearing

Construction Phase

- Construction Issues
- Safety and Health
- Construction Environmental Management
- Handover and Maintenance

Envelope B (Financial Submission)

Envelope (B) contains the following:

- The completed Letter of Tender incorporating the anti-collusion certificate and Form of undertaking (Performance Bond).
- The completed Contract Data.
- The completed Staff Rate Forms.

Marking of the Tenders:

Each tender submission will be assessed by two separate panels: a Quality panel and a Financial Panel.

- *Quality Panel:*

The Quality Panel met prior to the Financial Panel to assess quality scores and awarded marks, based on the tender criteria shown in Table (1), against the quality aspects stated earlier.

	Criteria	Marks
A	Very high standard with no reservations at all about acceptability	10
B	High standard but falls just short of A	8-9
C	Good standard and requirements met but some reservations	5-7
D	Acceptance with significant reservations but not sufficient to warrant rejection	1-4
E	Fails to meet requirements	0

Table (1): Standard Marks for Quality Questions

- *Financial Panel:*

The Financial Panel will appraise the financial element of the tender independently of the Quality Panel and after the Quality Panel has completed the assessment outlined above. The financial score will be carried forward to the final tender assessment.

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Marking of the Tenders:

- **Quality Scorings:**

The Quality Panel will award marks against the tender score criteria. The quality threshold below which tenders will be returned to the Tenderer with Envelope B, Financial Submission, unopened is 50 marks out of the 100 available or a zero mark against any one quality section. After weighting, the highest scored tender will be allocated 100 marks. Other tenders will be allocated marks on the basis of two marks reduction for each mark lower than the highest marked tender. The quality score for each tender will be carried forward to the final tender assessment.

- **Financial Scorings:**

The financial scoring will be split into three areas for assessment:

a) Hourly Rate by staff grade for Design Phase

The hourly rates by staff grade in the Design Phase. These rates will be inserted into a model prepared by the Employer containing his estimate of the number of hours required for the key members of staff and other supporting staff, to produce an estimate of the design fees payable in the Design Phase. The Design Phase fees will be compared by allocating the lowest fee (of those achieving the minimum quality standard) 100 marks, and then allocating other design fee marks on the basis of a reduction of one mark for each percentage point increase in fees. The hourly rates by staff grade in the Design Phase will make 20% of the overall financial assessment.

b) The Fee % for the construction Phase entered in Contract Data.

The fee % will be compared by multiplying the scheme cost estimate by each Tenderer's fee % to calculate a notional value of the fee purely for tender assessment purposes. The upper and lower fees in the range of submissions will be disregarded and average of the remaining three will be calculated. Marks will be calculated by allocating the average fee (of those achieving the minimum quality standard) 50 marks and then allocating other tendered fees on the basis of a reduction or addition of one mark for each percentage increase or decrease in fee. The lowest fee will result in the highest mark. The fee percentage will make up 40% of the overall financial assessment.

c) Schedule of Rates

The schedule of rates for work shall be completed in accordance with the instructions given and only included in the Financial Submission, Envelope B. These rates will be inserted into a model prepared by the Employer containing his estimate of the principal quantities to produce an estimate of the cost of the works. The cost of the works will be compared by allocating the lowest cost (of those achieving the minimum quality standard) 100 marks and then allocating other costs on the basis of a reduction of one mark for each percentage point increase in cost. The schedule of rates will make up 40% of the overall financial assessment.

Final Tender Assessment:

The contract will be awarded to the tenderer submitting the most economically advantageous tender in accordance with the award criteria. The individual award criteria which will be taken into account in making this assessment are: quality, which will account for 70% of the overall score and price which will account for 30% of the overall score. Following the calculation of the weighted overall marks, the highest overall score will be compared with any other scores that lie within 5% of this score. The tender with the best financial score of those within this range will be considered for award of this contract.

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THE CASE STUDY BACKGROUND:

The proposed project is for 'Road Improvement' comprises a new section of dual carriageway approximately 37Km in length.
Five Contractors submitted the Quality and Financial assessments. Tables (2, 3, 4, 5 and 6) present the quality tender assessment for tenderer A, B, C, D and E respectively.

	Weighting	Marks Awarded	Weighted Marks
General Scheme Management			
1. Overall Approach, Methodology and Programme	7	7	49
2. Innovation and Continuous Improvement Strategy	6	6	36
3. Public Relations	5	7	35
4. Risk	6	7	42
5. Target Cost and Activity Schedules	7	6	42
6. Open Book Accounting	6	5	30
7. Quality and Key Performance Indicators	6	7	42
8. Staff for the Project	6	6	36
9. Approach to Partnering	6	6	36
Design Phase			
10. Estimate of Time Base Hours for Work in Design Phase	4	7	28
11. Environmental Impact Statement	6	7	42
12. Environmental Data Requirements	4	8	32
13. Design Development	5	9	45
14. Compulsory Purchase Orders	4	6	24
15. Oral Hearing	4	6	24
Construction Phase			
16. Construction Issues	4	5	20
17. Safety and Health	5	5	25
18. Construction Environmental Management	5	5	25
19. Handover and Maintenance	4	6	24
Totals	**100**		**637**
Weighted Mark/10 (Maximum = 100)			**63.7**
Final Quality Mark	**100**		**84.0**

Table (2): Quality Tender Assessment for Tenderer A

	Weighting	Marks Awarded	Weighted Marks
General Scheme Management			
1. Overall Approach, Methodology and Programme	7	7	49
2. Innovation and Continuous Improvement Strategy	6	6	36
3. Public Relations	5	7	35
4. Risk	6	7	42
5. Target Cost and Activity Schedules	7	7	49
6. Open Book Accounting	6	6	36
7. Quality and Key Performance Indicators	6	7	42
8. Staff for the Project	6	8	48
9. Approach to Partnering	6	7	42
Design Phase			
10. Estimate of Time Base Hours for Work in Design Phase	4	9	36
11. Environmental Impact Statement	6	6	36

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12. Environmental Data Requirements	4	6	24
13. Design Development	5	7	35
14. Compulsory Purchase Orders	4	8	32
15. Oral Hearing	4	8	32
Construction Phase			
16. Construction Issues	4	7	28
17. Safety and Health	5	7	35
18. Construction Environmental Management	5	7	35
19. Handover and Maintenance	4	8	32
Totals	**100**		**704**
Weighted Mark/10 (Maximum = 100)			**70.4**
Final Quality Mark	**100**		**97.4**

Table (3): Quality Tender Assessment for Tenderer B

	Weighting	Marks Awarded	Weighted Marks
General Scheme Management			
1. Overall Approach, Methodology and Programme	7	6	42
2. Innovation and Continuous Improvement Strategy	6	8	48
3. Public Relations	5	7	35
4. Risk	6	9	54
5. Target Cost and Activity Schedules	7	6	42
6. Open Book Accounting	6	7	42
7. Quality and Key Performance Indicators	6	6	36
8. Staff for the Project	6	7	42
9. Approach to Partnering	6	5	30
Design Phase			
10. Estimate of Time Base Hours for Work in Design Phase	4	6	24
11. Environmental Impact Statement	6	7	42
12. Environmental Data Requirements	4	8	32
13. Design Development	5	8	40
14. Compulsory Purchase Orders	4	8	32
15. Oral Hearing	4	7	28
Construction Phase			
16. Construction Issues	4	6	24
17. Safety and Health	5	7	35
18. Construction Environmental Management	5	6	30
19. Handover and Maintenance	4	6	24
Totals	**100**		**682**
Weighted Mark/10 (Maximum = 100)			**68.2**
Final Quality Mark	**100**		**93.0**

Table (4): Quality Tender Assessment for Tenderer

	Weighting	Marks Awarded	Weighted Marks
General Scheme Management			
1. Overall Approach, Methodology and Programme	7	8	56
2. Innovation and Continuous Improvement Strategy	6	7	42
3. Public Relations	5	9	45
4. Risk	6	6	36

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5. Target Cost and Activity Schedules	7	7	49
6. Open Book Accounting	6	8	48
7. Quality and Key Performance Indicators	6	6	36
8. Staff for the Project	6	7	42
9. Approach to Partnering	6	8	48
Design Phase			
10. Estimate of Time Base Hours for Work in Design Phase	4	6	24
11. Environmental Impact Statement	6	7	42
12. Environmental Data Requirements	4	8	32
13. Design Development	5	7	35
14. Compulsory Purchase Orders	4	8	32
15. Oral Hearing	4	6	24
Construction Phase			
16. Construction Issues	4	7	28
17. Safety and Health	5	8	40
18. Construction Environmental Management	5	6	30
19. Handover and Maintenance	4	7	28
Totals	**100**		**717**
Weighted Mark/10 (Maximum = 100)			**71.7**
Final Quality Mark	**100**		**100**

Table (5): Quality Tender Assessment for Tenderer D

	Weighting	Marks Awarded	Weighted Marks
General Scheme Management			
1. Overall Approach, Methodology and Programme	7	7	49
2. Innovation and Continuous Improvement Strategy	6	6	36
3. Public Relations	5	6	30
4. Risk	6	7	42
5. Target Cost and Activity Schedules	7	8	56
6. Open Book Accounting	6	6	36
7. Quality and Key Performance Indicators	6	8	48
8. Staff for the Project	6	7	42
9. Approach to Partnering	6	7	42
Design Phase			
10. Estimate of Time Base Hours for Work in Design Phase	4	6	24
11. Environmental Impact Statement	6	7	42
12. Environmental Data Requirements	4	6	24
13. Design Development	5	8	40
14. Compulsory Purchase Orders	4	6	24
15. Oral Hearing	4	9	36
Construction Phase			
16. Construction Issues	4	7	28
17. Safety and Health	5	8	40
18. Construction Environmental Management	5	6	30
19. Handover and Maintenance	4	6	24
Totals	**100**		**693**
Weighted Mark/10 (Maximum = 100)			**69.3**
Final Quality Mark	**100**		**95.2**

Table (6): Quality Tender Assessment for Tenderer E

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The Quality assessment is followed by the Financial Assessment for the five Contractors as shown in Table (7)

Tenderer	Design Phase		Construction Phase			Schedule of Rates		Overall Financial Mark	Ranking
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	20% x (b) + 40% x (e) + 40% x (g)	
	Fee (€ Million)	Mark: Design Fee	% fee from Contract Data	Fee based on current Budget Cost (€ million)	Mark: Fee	National Cost (€ Million)	Mark SoR		
A	4.543	79.6	11.0	24.2	50	150.633	90.7	72.2	3
B	5.219	61.6	10.0	22	59.1	137.789	100	76.0	2
C	4.122	90.7	8.5	18.7	72.7	171.227	75.7	77.5	1
D	4.016	93.5	12.0	26.4	40.9	177.364	71.3	63.6	4
E	3.772	100	14.0	30.8	22.7	195.644	58	52.3	5

Table (7): Financial Assessment (Envelope B)

The Quality and Financial Assessment is then combined together as shown in Table (8).

Tenderer	(a)	(b)	Overall Mark	Ranking
	Quality Mark From Table	Financial Mark from Table	70% x (a) 30% x (b)	
A	84.0	72.2	80.5	5
B	97.4	76.0	91.0	1
C	93.0	77.5	88.4	3
D	100.0	63.3	89.1	2
E	95.2	52.3	82.3	4

Table (8): The Overall Assessment

Results from Table (8) show that Tenderer B has the highest overall mark. Taking note of all tenderers within 5% of the overall assessment for tenderer B gives a range to consider down to 91.0 x 0.95 = 86.5. Tenderers C and D lie within that range. Tenderer C has a higher financial mark than Tenderer B; Tenderer D has a lower financial mark than Tenderer B. Therefore, Tenderer C would therefore be considered for award of contract.

CONCLUSION

This study presents a contractor selection real life case study as different criteria were used for evaluating the submitted bids. The criteria were grouped under the financial and quality factors consisting of three branches, the general scheme management, the design phase and the construction phase. The method utilized for evaluation, the point's method, standardizes the evaluation process.

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