



## A Unified Knowledge-based Contractor Prequalification Methodology for the Egyptian Construction Industry

Ibrahim Abotaleb<sup>1</sup>, Ahmed Alkady<sup>2</sup>

<sup>1</sup> Graduate student, The American University in Cairo, Egypt.

<sup>2</sup> Graduate student, Cairo University, Egypt.

### Abstract:

Contractor prequalification is an important process that plays a significant role in ensuring successful construction projects. Since the construction industry in Egypt has been booming after two political revolutions, contractor prequalification is becoming more and more essential as it ensures the tenders are targeted to the proper contractors; thus focusing the efforts on the fittest competing firms. The prequalification process is usually managed by project managers assigned by the clients. By interviewing professional experts and studying the different prequalification processes and criteria of various Egyptian project management firms, it was highly noticed that almost all of them are made on ad hoc basis with no strong academic or professional grounds as the currently used criteria are poorly understood. This paper presents the results of an extensive ongoing research that concludes by providing an Egyptian Contractor Prequalification Evaluation Model (ECPEM). The model provides a number of evaluation criteria and evaluation weights for different project types. It also provides a guideline for scoring in order to maximize objectivity in evaluation. The ECPEM is tailored to suit the Egyptian construction industry, and is proposed by the authors to be used as the primary unified prequalification evaluation model by Egyptian project managers.

**Keywords:** Contractor prequalification, methodology, Egypt, construction.

### 1 Introduction

Contractor prequalification is the process of evaluating contractor documents prior to the issuance of the tender documents in order to prepare a shortlist of qualified contractors which are going to be the ones invited to the tender. Prequalification saves time and cost during the tender stage by limiting the tender to experienced and financially stable contractors. Both clients and contractors benefit from the prequalification process as it allows them to concentrate on the tendering process rather than be weighed down by issues of suitability and competency [1]. On the client's side, the prequalification eliminates incompetent, inexperienced and nonqualified contractors from the very beginning before entering the tender stage; also it is desirable to disqualify a contractor in this stage rather than proceeding to the tender stage and then showing that this contractor is not qualified after submitting the lowest tender. On the contractor's side it acts as an external audit to its capabilities if it wants to assess its current situation in the construction market. A large percentage of contractors feel that prequalification systems with stringent multi-criteria selection improves their chances of winning tenders [2].

In Egypt, the law governing the tender stage in the public entities (Law 89/1998) does not provide for the prequalification stage. However, it only states that two envelopes shall be submitted in the tender with no prior prequalification process; a technical envelope and a financial envelope. The technical envelope is opened and evaluated first, then the financial envelope is opened for the technically qualified contractors and finally the tenderer with the least price is selected. After two revolutions in Egypt, 2011 and 2013, the Egyptian government is looking forward to enhance the tendering system in the public entities by applying



the online tendering method which consequently entails modifying the current tender law (Law 89/1998) as some clauses that related to the submission of envelopes won't be applicable anymore. Online tendering allows contractors to receive soft tender documents through virtual plan rooms and subsequently submit their tenders through web-based service. There are several owners in USA accepting only online bids, so it is important for all entities working in construction industry to be aware with this new technology [3].

Several studies have been conducted to identify the most appropriate criteria and to arrange the decision factors that affect the prequalification process. Russel and Skibniewski (1988) [4] applied a generic logic in prequalification decision-making. The logic consists of two inputs and one output, the first input which (owner) is influenced by several factors as follows: the type of owner, the project objectives and type and size of work. The second input (contractor), it concerns with all information related to contractors. The output is the decision strategy. Russel presented several decision strategies that are used in prequalification namely: dimensional weighting, two-step prequalification, dimension wide strategy, prequalification formula, and subjective judgment. Moreover, Russel and Skibniewski (1990) [5] presented a model called Qualifier-1 that aids in the prequalification process. The model rationally structure, systemize the prequalification and enhance the evaluation of the candidates. Bubshalt and Al-Gobali (1996) [6] studied the prequalification process in Saudi Arabia; where decision factors were identified and their impact indices were calculated, then those decision factors were ranked according to their impact indices and compared to Russel and Skibniewski's ranking in order to assess the criteria used in Saudi Arabia and to highlight the minor difference between both criteria. Plebankiewicz (2009) [7] proposed a prequalification model based on fuzzy sets theory. The model takes into consideration both different criteria of contractor evaluation and the objectives the construction owner wants to achieve in the project.

Although the previous studies provide a systematic and organized approach to simplify contractors prequalification, no studies were found that investigate the prequalification process in the Egyptian construction industry. Since the Egyptian construction industry has its unique style, applying knowledge based from other countries, such as those in the literature review, is not efficient. The prequalification process in Egypt has to be investigated on its own and prequalification criteria and weights have to be tailor-made to suit the Egyptian construction industry, which is the purpose of this paper. Throughout the experience of the authors in contractor prequalification in Egypt, it has been found that the current prequalification process in Egypt has the following prominent shortcomings:

- The distinguishing between the public and private sector in prequalification is not applied; normally in public projects the public entity assigns an independent consultant to prepare a questionnaire and evaluate the results.
- Current scoring criteria (meaning how the score in each evaluation criteria is calculated) do not take into full consideration important factors such as the type of the project, its complexity, and the construction cost.
- The current scoring system is very subjective in its nature. If two experts were requested to evaluate a contractor using the same prequalification evaluation form, they would provide different final scores with large variance. Such shortcoming is a resultant of the lack of clear scoring rules. Evaluators often use past experiences, intuition, and predictive judgment in their evaluation of contractors. Hence, parties are more likely to be affected by erroneous assumptions and bias [8][9][10].
- There is no cut-off score for each criteria; meaning that the contractor can score a zero in a criteria and still get qualified. This needs to be changed by introducing cut-off scores that, shall a contractor score in a criterion less than the cut-off score, it gets disqualified.

This paper aims at presenting an Egyptian Contractor Prequalification Evaluation Model (ECPEM) that avoids the mentioned shortcomings by providing a comprehensive methodology of a generic evaluation scoring criteria for different project types and construction costs. The ECPEM is tailored to suit the Egyptian construction industry, and is proposed by the authors to be used as the primary unified prequalification evaluation model by Egyptian project managers.



## 2 Methodology:

### 2.1 Methodology of Forming the ECPEM

The Egyptian Contractor Prequalification Evaluation Model (ECPEM) is oriented towards the Egyptian construction market; where the criteria and their weights are tailored for construction projects in Egypt. However, it can be applied on national and international contractors. This section and Fig. 1 describe the methodology of forming the ECPEM.

1. **Identifying and defining the evaluation criteria:** A number of 28 evaluation criteria points were defined after examining the criteria used in the literature and analyzing the prequalification evaluation criteria of the top five project management firms in Egypt. Moreover, the experience of the authors in the field of prequalification evaluation and the Egyptian construction market contributed to the identification and defining process.

2. **Setting weights for the evaluation criteria for every project type:** Each project type (for example: hospitality, residential, industrial ...etc) requires a unique set of criteria weights. Unlike previous models in the literature, the ECPEM provides different criteria weights for the different project types. This is a more realistic approach; because, for example, experience is a much more important factor in hospital projects than residential projects in Egypt. So the experience holds a larger weight in hospital projects more than in residential projects.

3. **Defining the scoring standards for each criterion:** In order to minimize subjectivity from scoring, which is one of the main problems in almost all of the already existing prequalification evaluation models, certain standards, or “rules”, were defined for scoring in each of the criteria. Evaluators would be provided with these standards prior to the evaluation process and would abide by these standards in the evaluation process to produce an objective evaluation.

4. **Pre-finalizing the ECPEM:** This step is mostly computer-based work, where the evaluation criteria and their weights corresponding to different project types are organized in an Excel® spreadsheet. The spreadsheet also has evaluation forms for evaluators to use. These evaluation forms are automated where the final analysis and results are provided automatically after the evaluation to minimize the human and clerical errors.

5. **Validating the Model (Criteria and Weights):** Validation of the ECPEM shall be through distributing it along with questionnaires to a representable number of experts in the field. The questionnaires shall be oriented towards the criteria and the scores; where the experts would provide their opinion in the integrity of the ECPEM and whether some criteria should be modified, added, or deleted. After receiving feedback and comments from such questionnaires, modifications shall be made to the ECPEM accordingly. Note: This step is not yet performed; the research is still ongoing.

6. **Validating the Model (Objectivity):** After producing the final ECPEM, its objectivity, which is one of its main purposes, is tested by providing the prequalification data of a number of contractors to a number of experts. The experts would be required to evaluate the contractors using their normal evaluation methods in their corresponding firms. It is expected that the resulting scores would have high standard deviation because the normal evaluation methods are based on subjective manners. The experts would be asked to evaluate the same contractors again, but this time using the ECPEM. It

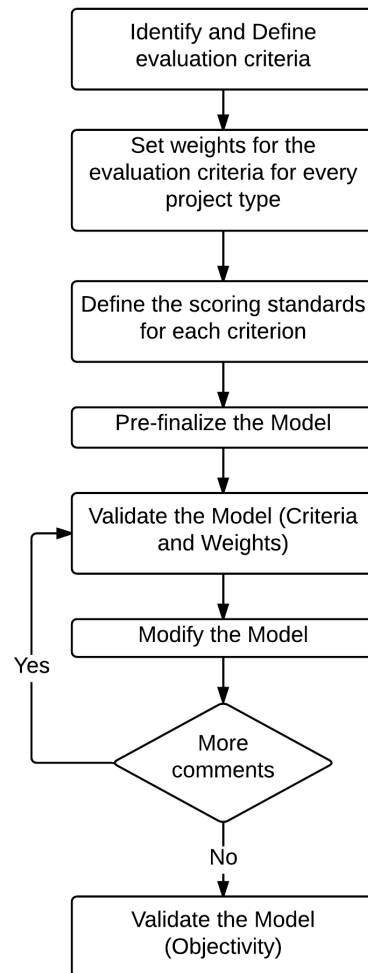


Fig. 1: ECPEM Forming Methodology



is expected that this time, their scores would have very low standard deviation; which is a good indication of high objectivity in the ECPEM. Note: This step is not yet performed; the research is still ongoing.

**2.2 Classification of Evaluation Criteria:**

- a) Static Criterion: Means the criterion is evaluated regardless of the project value or other project parameters.
- b) Dynamic Criterion: Means the criterion is evaluated depending on varying project parameters. In other words, the evaluation of the evaluator for a specific criterion does not depend only on the data provided by the evaluated contractor, but also on other project parameters such as project value.
- c) Ordinary Criterion: In an ordinary criterion, the minimum score is 0 (zero). In case the evaluated contractor scores a zero in such a criterion, the evaluation process goes on and the final score is calculated normally using Eqn. 1.
- d) Critical Criterion: In a critical criterion, the acceptable minimum is pre-specified. In case the contractor scores less than the acceptable minimum, which is referred to as the “cut-off score”, it gets disqualified without even completing the evaluation process. In everyday language, a score less than the acceptable minimum is a “deal breaker”.

**2.3 Final Score Calculation:**

$$Final\ Prequalification\ Evaluation\ Score = \sum \frac{S_{EC^i} \times W_{EC^i}}{No.\ of\ criteria \times 5}$$

Where,

- $S_{EC^i}$  : contractor score corresponding to evaluation criteria “i” (out of 5)
- $W_{EC^i}$  : scoring weight of evaluation criteria “i”

**3 The Egyptian Contractor Prequalification Evaluation Model (ECPEM)**

28 criteria for prequalification evaluation were identified and categorized under the following categories: 1) relevant experience and ongoing Projects, 2) structure and organization, 3) financial status, 4) personnel, 4) plant and equipment, and 6) additional information. It shall be noted that ALL evaluation criteria are scored out of 5. The score is then multiplied by the weight.

The following paragraphs explain the proper scoring standards that are introduced in this research for each of the evaluation criteria.

**3.1 Relevant experience and ongoing projects:**

Years of Experience: This criterion is both “dynamic” and “critical”. Scoring is not only depended on the years of experience, but also on the type of project and the project value as shown in Table 1.

**Table 1: Scoring rules for the “Years of Experience” evaluation criteria (Project Value in EGP)**

Project Type		Residential & Commercial		Hospitals & Hotels		Industrial		Schools		Infrastructure	
Project Value		<10 M	>10 M	<20 M	>20 M	<10 M	>10 M	<10 M	>10 M	<15 M	>15 M
Cut-off score		N/A	0	1	2	1	1	0	0	0	1
Score	<2 yrs.	1	0	1	1	1	0	1	0	1	0
	2-5 yrs.	2	1	1.5	1	2	2	2	1	2	1
	5-10 yrs.	4	2.5	2	2	3	3	3	2	3	2
	10-15 yrs.	5	4	3	3	4	4	4	3	4	3
	15-20 yrs.	5	5	4	4	5	4	5	4	5	4
>20 yrs.	5	5	5	5	5	5	5	5	5	5	



Number of years indicates the applicant involvement in construction field and it gives an indication on the applicant's capabilities and experience. However this shall not be an accurate indication to the applicant's experience as most of his experience may be in small-scale projects, so this point shall be complemented by evaluating the applicant's previous projects.

**Specialty of Services:** This criterion is "static" and "critical". The cut-off score is 0. The scoring rule is simple; if the contractor is specialized in the type of services required in the project, it takes the score of 5. If not, then the score is 0 and the contractor is disqualified. If the it specializes in half of the services required for the project, the score would be 2.

**Projects Completed Locally:** Contractors shall provide information about the amount, value, and types of works and projects that they finished in Egypt in the past 10 years. According to this information, the contractors' capabilities can be assessed. Contractors shall demonstrate that they have carried out work of a nature, size, value, and complexity similar to that of the project in question. They also shall submit completion certificates for the projects finished in the preceding 5 years. First, the applicant should have carried out similar work of at least a magnitude approximating that of the package of work for which prequalification is sought. Depending on the nature of the works to be bided, the criterion should be related to the applicant having carried out one or more projects of a certain value referred to that of the proposed project over a specified period, usually the last five years (or less, in special circumstances). Second, the applicant should have performed operations of a volume and quality similar to those required for the project. The following equations calculate the average value index (AVI), maximum value index (MVI) and relativity index (RI). Every index is then corresponded to a score. Accordingly, the overall score of this criteria is calculated. This criterion is "static" and "critical". The cut-off score is 1.

$$\text{Average Value Index [AVI]} = \frac{\text{Average value of completed projects in the last 10 years}}{\text{Value of project in hand}}$$

$$\text{Max. Value Index [VMI]} = \frac{\text{Maximum value of a completed project in the last 5 years}}{\text{Value of project in hand}}$$

$$\text{Relativity Index [RI]} = \text{No. of finished projects (past 10 yrs) with similar scope as the project in hand}$$

**Table 2: Scores corresponding to the different indices in the locally completed projects**

AVI Value	S <sub>AVI</sub>	MVI Value	S <sub>MVI</sub>	RI Value	S <sub>RI</sub>
AVI < 0.5	1	MVI < 0.7	0	RI < 1	0
0.5 ≤ AVI < 1	2.5	0.7 ≤ MVI < 1	1	1 ≤ RI < 3	1
1 ≤ AVI < 2	4	1 ≤ MVI < 2	3	3 ≤ RI < 6	2
AVI ≥ 2	5	2 ≤ MVI < 3	4	6 ≤ RI < 12	4
		MVI ≥ 3	5	RI ≥ 12	5

$$\text{Score for the "Projects Completed Locally" Criterion} = \frac{S_{AVI} \times S_{MVI} \times S_{RI}}{3}$$

**Projects Completed Internationally:** This criterion is "static" and "ordinary". Since the prequalification is made for contractors for projects in Egypt, this evaluation criterion doesn't have a large weight. Projects Completed Internationally provide information about the scale of the applicant's company and its scope and organization. A company with many international projects generally (but not for all cases) has more capabilities than a company with no international projects and thus is given a higher grade. Score of the criterion is equal to the number of projects completed internationally in the past 10 years; with a maximum score of 5.

**Projects in Progress:** Projects in Progress provide information about the amount, value, and types of works that the applicant is currently holding. The value of these projects is compared to the annual value of construction works and the values of the previous projects in order to check and evaluate the



applicant's current position. The assessed available bid capacity should be more than the cost of the project.

$$\text{Assessed Available Bid Capacity [AABC]} = (A \times N \times 1.5) - B$$

Where,   
*A* = max. value of works executed in any 1 year during the last 5 years  
*B* = Value of the existing on-going works to be completed during the period of the project.  
*N* = No. of years prescribed for completion of the project

**Table 3: Score of the “Projects in Progress” Criterion**

Ratio of AABC to the value of project in hand	<0.5	0.5→1	1→1.5	1.5→3	>3
Score of the “Projects in Progress” Criterion	0	1	2.5	4	5

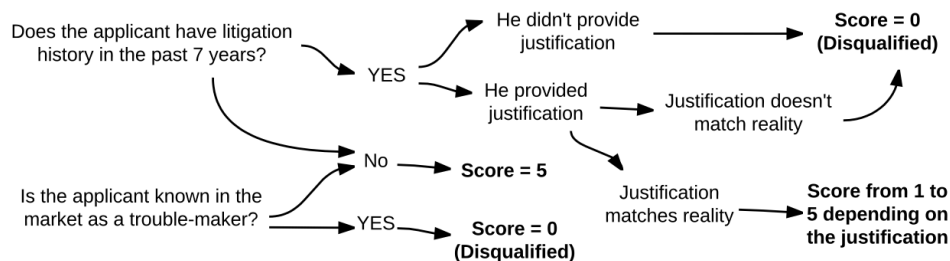
Failure to complete any awarded work in the last 7 years: If the applicant had failed to complete any awarded works and it was proven to be that he is the reason for this failure, he shall be disqualified. If not, then the score in this criterion shall be 5.

### 3.2 Structure and Organization

Sub contracting: This criterion is “static” and “ordinary”. The contractor would be asked to indicate if it is foreseen that any part of the project will be sub-contracted and if known, give the names and addresses of the sub-contractors. The contractor shall also state the percentage and the type of subcontracted work in comparison to the works that it does by own resources. If contractor does not fill this part, it scores a zero in this criterion. If the contractor sub-contracts most of the works assigned to it, then it receives a score between 1 and 3 depending on the evaluator’s judgement. If the contractor sub-contracts secondary and specialized works, or if it does all the work by its own resources (which is highly unlikely) it receives a score of 4 or 5 depending on the evaluator’s judgement.

Familiarity with the Construction Management System: This criterion in “static” and “ordinary”. The contractor shall provide that it worked in projects in the presence of Project Management Firm and shall provide information about these projects in order to get the maximum score of 5 points. Failing to provide the requested information leads to a score of 0.

Litigation History: Applicant to provide accurate information on any litigation or arbitration resulting from contracts completed or under execution by the applicant over the last seven (7) years. Litigation history gives an indication on the previous relations of the applicant with other clients, it also indicates the number of disputes were the applicant are involved in them during the last 7 years. Scoring in this criterion is in accordance to the following diagram.



**Fig. 2: Scoring for the “Litigation History” evaluation criteria**

Organization Chart: Shows the structure of the contractor’s company, the relationships and relative ranks of its parts and positions/jobs and the way of communication between managers and employees. This criterion is “static” and “ordinary”. A good organization structure ensures good communication between the project teams and the functional departments, whilst maintaining clear authority lines. Maximum score in this criterion is 5 and minimum is 2 depending on the evaluator’s judgement. However, in case the contractor does not submit the required information, it receives a score of zero.



### 3.3 Financial Status

The Applicant shall demonstrate that it has access to, or has available, liquid assets, lines of credit, and other financial means sufficient to meet the construction cost for the entire period it also measures status of the assets, liabilities, and owners' equity (and their interrelationships) of an organization, as reflected in its financial statements. All of the criteria related to the financial status are “static” and “ordinary”. Failure of the applicant to submit required information in any of the following criteria results in scoring a zero in the corresponding criteria.

**Bank Letters and Guarantees:** Bank letters are based on the bank's experience with the applicant, the applicant's use of the bank credit facilities has so far been satisfactory. Also they shall reflect good and stable financial status.

**Annual Average Value of Work for the Last 3 Years:** This acts as an indication of the company's ability to achieve

consistently levels of turnover in construction work. Scoring rules of this criterion are shown in Table 4.

**Current Assets to Current Liabilities:** This ratio is an indication of the current liquidity of the applicant's finances. It reveals the applicant's ability to meet his current obligations. Scoring rules of this criterion are

shown in Table 5.

**Fixed Assets to Fixed Liabilities:** This ratio is an indication of the company's finances health. It reveals the applicant's ability to meet his long-term commitments. Scoring rules of this criterion are shown in Table 6. 5 Points are allocated as follows:

Profit for the last 3 years: This is an indication of the company's financial stability and a measure of possible future problems. Profit margin is the ratio of net income to revenues. Scoring rules of this criterion are shown in Table 7.

### 3.4 Personnel

**Number of Staff:** This criterion is “dynamic” and “critical”. As the project cost increases, the more strict the scoring becomes in this criterion as shown in Table 8.

**Key Personnel Experience and Qualifications:** The key personnel proposed to carry out the works are evaluated primarily for their qualifications and experience. The scoring is based on such factors as:

- The level of their qualifications and relevance to their position in the company and in the project.
- The type and years of experience and its relevance to the work to be carried out.

Scoring rules for this criterion are presented in Table 9. The evaluator has the liberty to deduct any points in case he did not find the key personnel having enough training or certifications. Years of experience shall be in relevant projects to the subject prequalification project.

**Table 4: Scoring rule depending the annual turnover**

Turnover / year	Score
> 1M EGP	5
Between 0.7M and 1M EGP	3
Between 0.4M and 0.7M EGP	1.5
< 0.4M	0

**Table 5: Scoring rule depending the current ratio**

Current Ratio	Score
Between 1.5 and 3	5
Between 1.5 and 2	3
Less than 1.5 or more than 3	0

**Table 6: Scoring rule depending the fixed assets to fixed liabilities**

Fixed Assets to Fixed Liabilities	Score
> 1.25	5
Between 1 and 1.25	3
< 1	0

**Table 7: Scoring rule depending the profit margin**

Profit Margin	Score
> 10%	5
Between 5% and 10%	5
Between 0% and 5%	3
< 0	0

**Table 8: Scoring rule for the “number of staff” criterion**

Project Value →	1M to 5M	5M to 20M	20M to 75M	> 75M
<b>No. of Employees</b>	<b>Score</b>			
> 2000	5	5	5	5
1000-2000	5	4	4	2.5
500-1000	4	3	2	1
200-500	3	2	1	0
< 200 employee	1	1	0	0



**Table 9: Scoring rule for the “key personnel experience and qualifications” criterion**

Years of Experience →	<7	7 to 10	>10	- Total score is the summation of each of the corresponding points on the left. - The site engineer shall be replaced in case of hotels with interior designer and architect, in case of infrastructure with civil / material engineer, in case of schools and hospitals with architect and in case of industrial projects with mechanical engineer and electrical engineer.
Position	Points			
Construction Manager	0	0	2	
Lead Site Engineer	0.5	0.75	1	
Lead Planning Engineer	0.5	0.75	1	
Lead Quantity Surveyor	0.5	0.75	1	

**3.5 Plant and Equipment:**

Contractor shall indicate the main plant and equipment considered by the company to be necessary for undertaking the project and whether this plant is already in the company's ownership or will be purchased or hired. This criterion is “dynamic” and “critical”. A Contractor that does not own necessary equipment needs to invest heavily in equipment and has several shortcomings: 1) Financial - the cost of purchase of necessary equipment, and 2) Time - order, purchase and mobilization. Scoring rules for this criterion are presented in Table 10.

**Table 10: Scoring of the “Plant and Equipment” Criterion**

Criteria	Points	Conditions				
Tower Cranes	Shown in Table 11	0.25% of grade if more than or equal 8		0.25% of grade for mentioning the present value	0.25% of grade for mentioning that the Age is less than 15 years or Condition is Good	0.25% of grade for being owned & 0.12% of grade for being rented
		0.12% of grade if less than 8				
Batch Plants		0.25% of grade if more than 1				
		0.12% of grade if only 1				
Concrete Pumps		0.25% of grade if more than or equal 2				
		0.12% of grade if less than 2				
Excavators		0.25% of grade if more than 8				
		0.12% of grade if less than 8				
Trucks		0.25% of grade if more than 10				
		0.12% of grade if less than 10				
Loaders & Dozers	0.25% of grade if more than 10					
	0.12% of grade if less than 10					

**3.6 Additional Information**

HSE: It is very important for a contractor to have an HSE department with an experienced manager and site representatives who can implement the company’s HSE Plan. The HSE plan of the company is evaluated and whether the company has the capable personnel to implement that plan. Also, looking at previous records of accidents provides information on the types of accidents that occur with the contractor and whether the Health and Safety Plan is active or not. This criterion is “static” and “critical”. Scoring shall be as follows: 1) Having an HSE department → 2 points, 2) HSE manager has a good resume with sufficient certifications and experience → 1.5 points, 3) HSE manual is comprehensive and not too generic → 1.5 points. The score is the summation of points. In case the value of the project in question is more than EGP 30 Million, the cut-off score is 2.5.

Procurement and Material Management: The presence of Procurement Department in a way guarantees the company’s capabilities of organizing and managing procurement with minimal mistakes and delays. The contractor shall submit the resume of the procurement department head and the procurement manual. This criterion is “static” and “ordinary”. Scoring shall be as follows: 1) Having an procurement department → 2 points, 2) procurement manager has a good resume with sufficient certifications and experience → 1.5 points, 3) procurement manual is comprehensive and not too generic → 1.5 points. The score is the summation of points.





**Scheduling:** The contractor's scheduling and planning abilities are evaluated in this section by providing a copy of a previous schedule made by the contractor and evaluating the software used in schedule and the planning department experience. The contractor shall demonstrate its ability to formulate complex schedules.

**Quality Assurance / Quality Control:** The presence of QA/QC department is important to ensure the quality and safety of the materials. The contractor shall provide the QA/QC plan and the contacts – preferably the CV- of the QA/QC manager. This criterion is “static” and “ordinary”. Scoring shall be as follows: 1) Having a QA/QC department → 2 points, 2) QA/QC manager has a good resume with sufficient certifications and experience → 1.5 points, 3) QA/QC manual is comprehensive and not too generic → 1.5 points. The score is the summation of points. In case the value of the project in question is more than EGP 30 Million, the cut-off score is 2.5.

**Certification by an Independent Auditing Body:** This criterion is “static” and “ordinary”. In this criterion, the score is always 5. In case the contractor is certified by an independent auditing body such as the ISO, it shall submit the certificate, and its score becomes 10 (meaning that there are +5 bonus points).

Table 11 shows all of the evaluation criteria in the ECPEM and their corresponding weights for the different project types. Past prequalification models did not differentiate between the types of projects. The ECPEM takes this into consideration by using customized and different evaluation criteria weights for different types of projects. The weights in Table 11 are the initial weights; where they might undergo modifications as the research progresses. As stated in the methodology, a questionnaire shall be distributed to experts to enhance the criteria weights.

**Table 11: Scoring of the “Plant and Equipment” Criterion**

Evaluation Criteria (EC)	Scoring Weights (W)						
	Types of Projects						
	Residential	Commercial	Hospitals	Hotels	Industrial	Schools	Infrastructure
<b>Relevant Experience and Ongoing Projects</b>							
1 Years of Experience.	4	3	4	4	4	3	3
2 Specialty of Services	2	2	3	3	3	3	3
3 Projects Completed Locally	3	4	5	5	5	4	5
4 Projects Completed Internationally	1	1	2	2	2	1	1
5 Currently Ongoing Projects	3	3	2	2	2	2	2
6 Failure to Complete Any Work in the Last 7 Yrs	2	2	2	2	2	2	2
<b>Structure and Organization</b>							
7 List of subcontractors and firms contracted	4	4	4	4	4	4	3
8 Familiarity with Construction Management System	2	3	3	3	3	2	3
9 Litigation History for the past 7 years	2	2	2	2	2	2	2
10 Organization Chart	2	2	2	2	2	2	3
<b>Financial Status</b>							
11 Bank Letters and Guarantees	5	4	4	4	4	4	4
12 Annual average value of work for the last 3 years	4	5	3	4	4	4	4
13 Current Assets to Current Liabilities	5	4	4	5	3	4	4
14 Fixed Assets to Fixed Liabilities	4	4	5	3	5	4	4
15 Profit for the Last 3 Years	3	4	4	4	4	5	4
<b>Personnel</b>							
16 Number of Staff	6	5	5	5	5	5	5
17 Key Personnel Experience & Qualifications	10	10	10	10	10	10	10
<b>Plant and Equipment</b>							
18 Tower Cranes	4	6	4	4	4	4	2
19 Batch Plants	5	4	4	4	4	5	4
20 Concrete Pumps	5	4	4	4	4	5	2
21 Excavators	2	2	2	2	2	2	4
22 Trucks	2	2	2	2	2	3	4
23 Loaders & Dozers	2	2	2	2	2	3	4
<b>Additional Information</b>							
24 HSE	3	4	4	4	4	4	4
25 Procurement and Material Management	5	5	5	5	5	4	5
26 Scheduling	4	3	3	3	3	3	3
27 Quality Assurance / Quality Control	3	3	3	3	3	3	3
28 Certification by an Independent Auditing Body	3	3	3	3	3	3	3
<b>Total</b>	100	100	100	100	100	100	100



#### 4 Conclusion:

Contractor prequalification is an important process that plays a significant role in ensuring successful construction projects. This paper presented the results of an extensive ongoing research that concludes by providing an Egyptian Contractor Prequalification Evaluation Model (ECPEM). The model provides a number of evaluation criteria and evaluation weights for different project types. It also provides a guideline for scoring in order to maximize objectivity in evaluation. The ECPEM is tailored to suit the Egyptian construction industry, and is proposed by the authors to be used as the primary unified prequalification evaluation model by Egyptian project managers. 28 criteria for prequalification evaluation were identified and categorized under the following categories: 1) relevant experience and ongoing Projects, 2) structure and organization, 3) financial status, 4) personnel, 4) plant and equipment, and 6) additional information. The criteria are identified as “static”, “dynamic”, “ordinary”, or “critical”. The scoring of all criteria is out of 5, then the score is multiplied by the weight, which is different in every criterion and in every project type. The ECPEM takes the different project types into consideration in the criteria weights. It also takes into consideration the value of the project in the scoring of the “dynamic” criteria. The ECPEM is tailored to suit the Egyptian construction industry, and is proposed by the authors to be used as the primary unified prequalification evaluation model by Egyptian project managers. The research is still ongoing. Upcoming steps shall concentrate on validating throughout extensive questionnaire and interviews with different experts in the field. Additional validation steps shall include evaluation of real Egyptian contractors using the ECPEM and measuring its accuracy throughout different qualitative and quantitative measures.

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