

Evaluation of construction companies performance by using stepwise weight assessment ratio analysis

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ABSTRACT

The extent to which the facility and the construction process meet and/or surpass a client's expectations is critical for client satisfaction. As a result, company evaluation is a well-established procedure in project management in the construction industry to ensure projects are performed in compliance with the contract documents and applicable laws and regulations. The purpose of this study is to present and debate certain criteria for evaluating the Iraqi construction sector companies' performance based on Stepwise Weight Assessment Ratio Analysis (SWARA) to assess company responsibility and performance in support of future projects. The evaluation criteria of construction companies are studied in this paper. The criteria have been categorized into main groups: (a) organization and management; (b) time; (c) quality; (d) cost; (e) resource; (f) safety practices. The main criteria have been divided into forty-four sub criteria. The findings of this paper demonstrate that the most important criteria in evaluating the construction companies' performance is cost, followed by time, quality, organization and management, resources, and lastly safety practices which ranked based on the weight of criteria (35.7%, 24.2%, 16.3%, 11.2%, 7.4%, 5.2% respectively) with the SWARA technique.

Keywords: Construction, Companies, SWARA, Performance Evaluation, Management

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1. Introduction

The construction industry is a vital sector that has a significant impact on a country's economic development and national society. It has the potential to help the country create a large number of job opportunities. The construction industry's growth is inversely linked to the country's economic growth. [1]. In the management of construction firms, performance measurement is critical. It gives the required data for process control and allows for the setting of difficult yet achievable goals. It is also essential to support the business strategies implementation [2]. As a result, the most important evaluation criteria for the company's performance in the Iraqi field of construction is studied in this paper. Weight assessment is a significant subject in several MCDM problems. One of the new techniques is the SWARA approach. An expert's perspective on estimates and weight computations is important in this technique. Reference [3] state that, every expert selects the significance of every criterion. All the factors are ranked by each expert in descending order from the first to the last one. The expert makes use of his or her own implicit knowledge, information, and abilities. The most important criterion is ranked first, and the least important criterion is ranked last, according to this procedure. The key advantage of this decision-making process is that important problems are defined in some cases, based on company or country policies, and there is no need for a ranking factor assessment. As a result, SWARA may be effective for some topics where priorities have been established based on previous events. Researchers have investigated and employed SWARA in a variety of domains in the past such as for machine tool selection [4], facility location

problem [5], architect selection [6], evaluating sustainability indicators of the energy system [7], personnel selection problem [8], evaluating the prominent criteria in high tech industry investment prioritization [9], evaluating the criteria for solar projects [10], project selection [11], [12].

Since there is no systematic study on the criteria for evaluating construction companies in Iraq, therefore this paper aims to fill a research gap by evaluating the performance of Iraqi construction sector enterprises using the SWARA method. The importance of research will be highlighted in this study by analyzing crucial performance evaluation criteria for construction companies. The following is a breakdown of the paper's structure. The data and methods used, as well as the procedural stages, are detailed in the following section. Section 3 demonstrates the results and discussion. Lastly, conclusions are drawn in the last section of this paper.

2. Data and methods

2.1 Identify the main criteria and sub-criteria

To identify the main criteria and sub-criteria for construction companies' evaluation, for construction companies' evaluation, the researcher studies the literature review related to the research and extract a number of criteria, and interviews with project managers, group of experts, academics, professionals and engineers in government institutions to find out the criteria from their perspective about evaluation of construction companies.

2.2 Use the focus group discussion (FGD) technique

Used the Focus Group Discussion (FGD) technique with experts and specialists and decision-makers to select the criteria and sub-criteria to be suitable with Iraqi environmental and requirements.

In the table 1, the six Main Criteria (MC) and forty-four Sub-Criteria (SC) for performance evaluation of construction companies captured and selected by theoretical study and field work [13], [14], [15], [16], [17].

Table 1. The criteria for evaluating a company's performance

Code	Main Criteria	Sub-criteria	Code	Justifications for selection the criteria
OMMC	Organization and Management	Cooperation/Responsiveness with project staff, client, and representatives	OMSC1	The purpose of this criteria is to evaluate to what extent are the company executes the directions.
		Follow chain of authority and comply with directions	OMSC2	
		Actively and cooperatively participate in the settlement of project issues.	OMSC3	
		Promptly resolve any issues after notification	OMSC4	
		Meet expectations on project coordination	OMSC5	
		Carry out activities in a timely manner that does not disrupt other people's work or cause harm to their property.	OMSC6	
		Any issues that arise are quickly resolved.	OMSC7	
		Work with subcontractors to exercise authority, coordinate, and supervise work operations to ensure the timeline and requirements are met.	OMSC8	
TMC	Time	Schedule the work and follow it	TSC1	The purpose of this criteria is to evaluate to what extent are the company is experienced and active at scheduling work and arranging construction activities, including starting and finishing the project on time and meeting important
		Initial project schedule suitability	TSC2	
		Observance of the agreed-upon schedule	TSC3	
		Timeliness and accuracy of schedule updates	TSC4	
		Adherence to recovery schedule and timely submittal	TSC5	
		Notification of changes to the schedule in a timely manner	TSC6	

Code	Main Criteria	Sub-criteria	Code	Justifications for selection the criteria
				intermediate phases according to the contract.
QMC	Quality	<p>Meet the contract requirements</p> <p>Provide an effective inspection and quality control procedures</p> <p>Workmanship quality</p> <p>Work Quality of Subcontractors</p> <p>Plan and specification adherence</p> <p>QA/QC Plan Adequacy</p> <p>Implementation of the QA/QC Plan</p> <p>QA/QC Documentation</p> <p>Adequacy of Materials</p> <p>Timely correction of deficient work</p>	<p>QSC1</p> <p>QSC2</p> <p>QSC3</p> <p>QSC4</p> <p>QSC5</p> <p>QSC6</p> <p>QSC7</p> <p>QSC8</p> <p>QSC9</p> <p>QSC10</p>	<p>The purpose of this criterion is to see how well the organization meets deadlines for delivering required documentation and reports.</p> <p>This incorporates, but is not limited to, delivery tickets, certification of supplies, invoices, progress schedules, shop drawings, contractor staking, material samples, requests for extensions of time, and contractor QA/QC plans and documentation</p>
CMC	Cost	<p>Follow the contract's labor standards/wage-rate requirements.</p> <p>Laws and regulations compliance and early payment.</p> <p>Accuracy of payrolls and other required documentation.</p> <p>Identify changes as were needed, not at the end of the task or project</p> <p>Avoiding and minimizing change orders</p> <p>Documentation of the change order</p> <p>Pricing of the change order</p> <p>Timely performs change order work</p>	<p>CSC1</p> <p>CSC2</p> <p>CSC3</p> <p>CSC4</p> <p>CSC5</p> <p>CSC6</p> <p>CSC7</p> <p>CSC8</p>	<p>The object of this criterion is to see how well the company adheres to all applicable rates of wage, employment laws, and regulations, as well as submit correct certified payrolls and pay all subcontractors on time.</p>
RMC	Resources	<p>Enough equipment to finish the job on time</p> <p>Personnel who are both competent and sufficient to accomplish the assignment on time.</p> <p>All of the equipment complies with or exceeds the specifications.</p> <p>Adjust resources in response to demands of the project delivery schedule</p> <p>Trained and Skilled Workforce</p>	<p>RSC1</p> <p>RSC2</p> <p>RSC3</p> <p>RSC4</p> <p>RSC5</p>	<p>This criterion is used to determine whether the company has appropriate and appropriate equipment to maintain the project on track. Is the equipment capable of meeting the parameters and producing a high-quality product?</p>
SMC	Safety Practices	<p>Take the initiative to ensure the safety and health of the employees</p> <p>The safety equipment is in perfect working order.</p> <p>Follow good safety practices</p> <p>Take adequate precautions with any hazardous materials</p> <p>Properly report all injuries or damage associated with project</p> <p>Conduct the Periodic audits of compliance</p> <p>Minimizes job-site accidents</p>	<p>SSC1</p> <p>SSC2</p> <p>SSC3</p> <p>SSC4</p> <p>SSC5</p> <p>SSC6</p> <p>SSC7</p>	<p>This criterion is used to determine whether the company has good safety practices. Is the company following its safety program and complying with regulatory requirements?</p>

2.3 Extract main and sub-criteria weights by used the (SWARA).

It is one of the techniques for determining weight values that play an important role in a decision-making process. The following steps will explain the essential principles of SWARA as well as the technique for determining the relative weights of criteria. [18]:

2.3.1 Ranking the criteria

The importance of each criterion should be prioritized. The experts rank the defined criteria in order of relevance throughout this phase. The final list of criteria is listed from the most important to the least important.

2.3.2 Determine value of (Sj)

Calculate the value of the average value's (Sj) comparative significance. Determine the relative importance Sj of criterion (j) in respect to criterion (j-1) starting with the second criterion, then repeat for each criterion. The criterion (Cj) is less important than (Cj-1)

$$S_j \leftrightarrow j + 1 = \sum_{k=1}^r C_j \leftrightarrow j + 1 / r \quad (1)$$

Sj = Significance of the average value

J= 2,3,....

Cj= Current criteria more important than criteria

h= No. of experts

2.3.3. Determine value of (Kj)

The value of (Kj) find by calculate the coefficient (Kj) as follows:

$$K_j = \begin{cases} 1 & j=1 \\ S_j + 1 & j>1 \end{cases} \quad (2)$$

Kj= Coefficient of criteria

J= 2,3,...

Sj+1 = Significance of the average value

2.3.4. Determine value of (qj)

Re-calculated weight qj as follows:

$$q_j = \begin{cases} 1 & j=1 \\ q_{j-1} - 1/K_j & j>1 \end{cases} \quad (3)$$

qj= Re-calculated weight

Kj= Coefficient of criteria

qj-1= The previous re-calculated weight

2.3.5. Calculate the weight of criteria

$$W_j = q_j / \sum_{k=1}^m q_j \quad (4)$$

Wj: denotes the relative weight of criteria.

3. Results and discussions

The main criteria include Organization and Management, as well as time, cost, quality, resource, and safety. are deemed the essential criteria that are utilized in evaluating the company's performance in Iraq. Everyone main

criteria were broken down into sub-criteria. To evaluate the weights of criteria, the SWARA technique was applied to determine the main and sub criteria weights.

3.1. Ranking the main and sub criteria

The first stage is the one that all the eight experts rank criteria on their opinion, then a new (final) ranking is obtained by averaging the criteria rankings, which is shown in Figure 1, 2,3,4,5,6, and 7. The main criteria are listed in descending order by experts in Table 1. Through using the interval rating (1–5) Likert scale, where 5 denoted Very High, 4 High, 3 Medium, 2 Low, and 1 Very Low, each expert determines their preferred level of ratings for each single specified criterion.

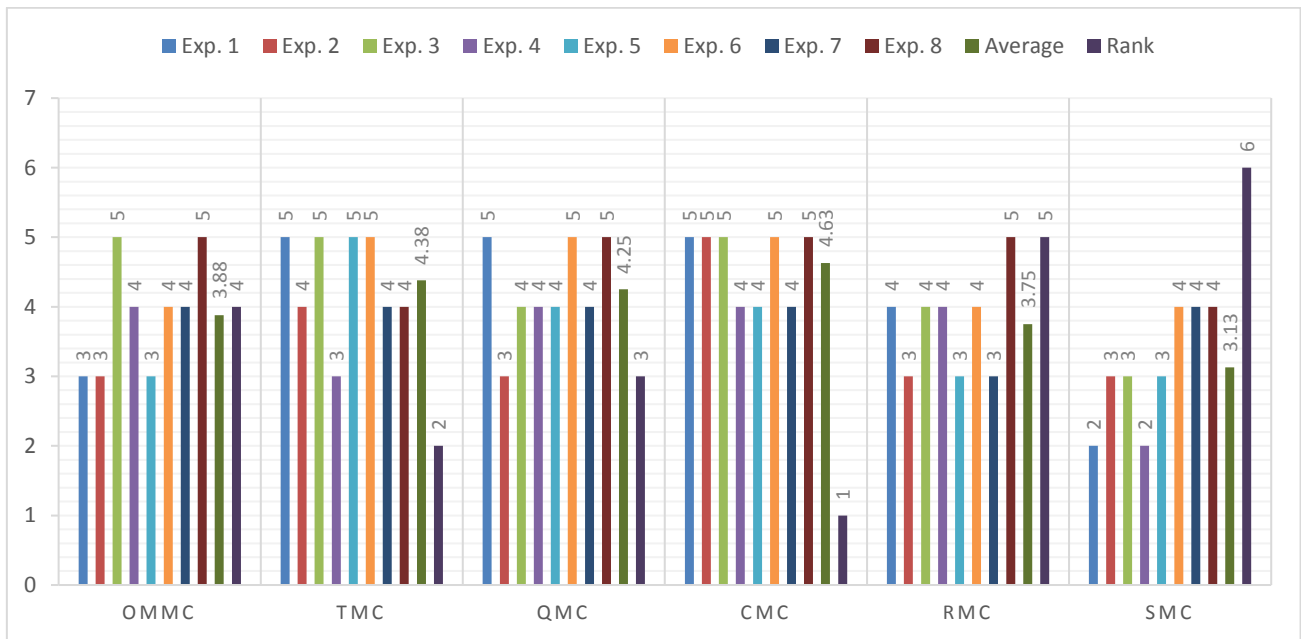


Figure 1. Main criteria ranking

Experts have ranked the main criteria. Obtained rank of criteria indicate that the cost criteria are the first rank, while second criteria rank is time. quality has third rank, organization and management criteria was fourth rank, while the safety and resource have a fifth and sixth rank respectively. Figure 2, 3,4,5,6 and 7 illustrate how experts ranked the sub-criteria.

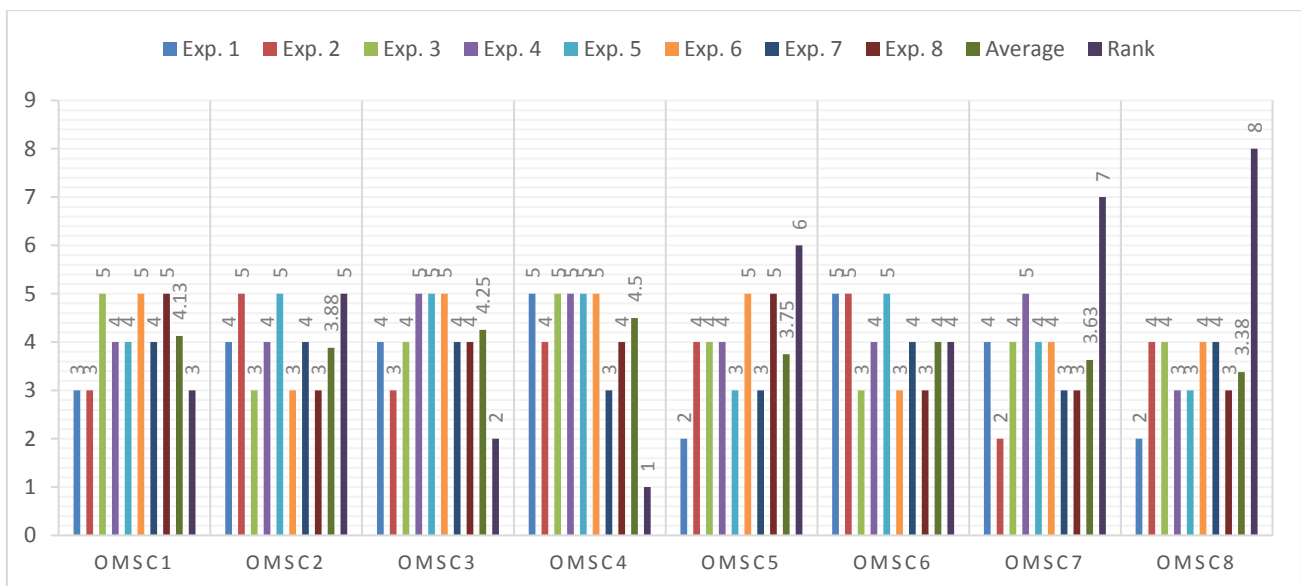


Figure 2. Organization and management sub-criteria ranking

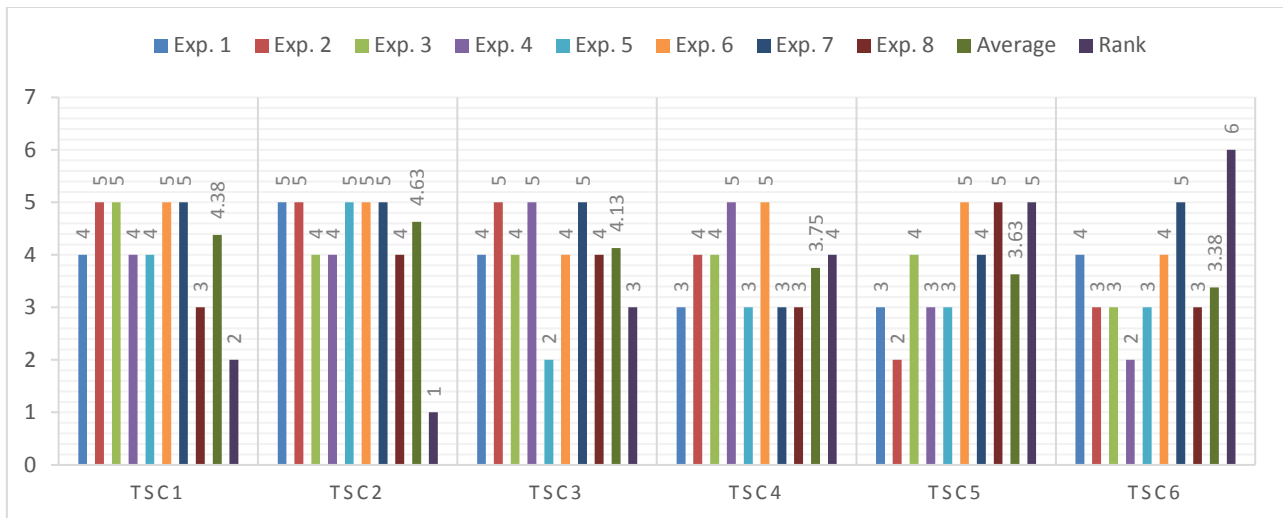


Figure 3. Time sub-criteria ranking

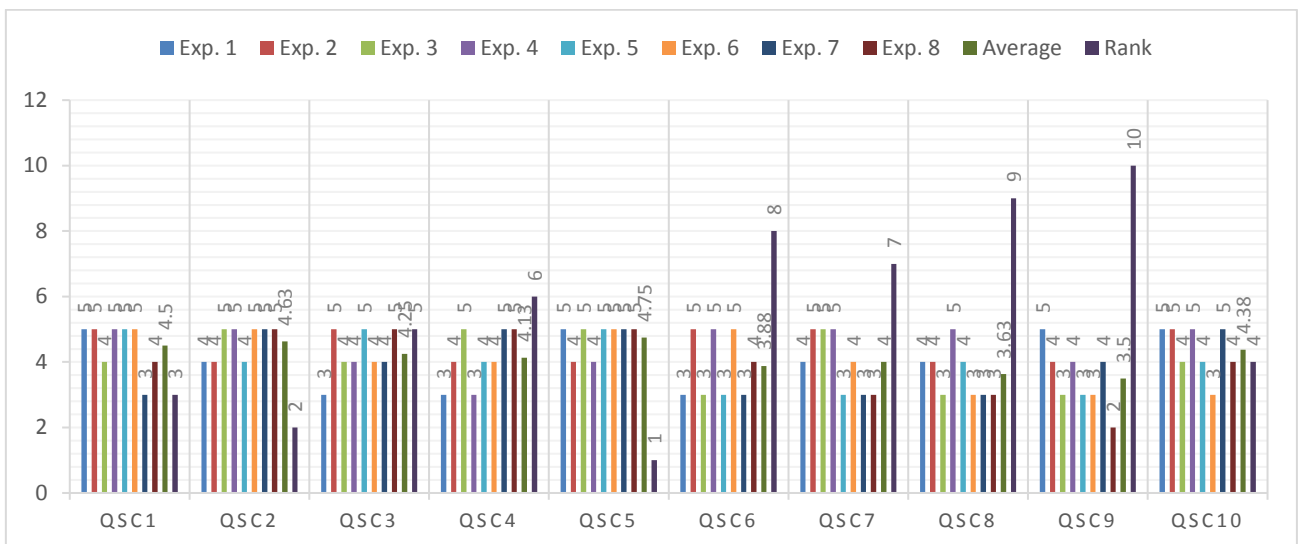


Figure 4. Quality sub-criteria ranking

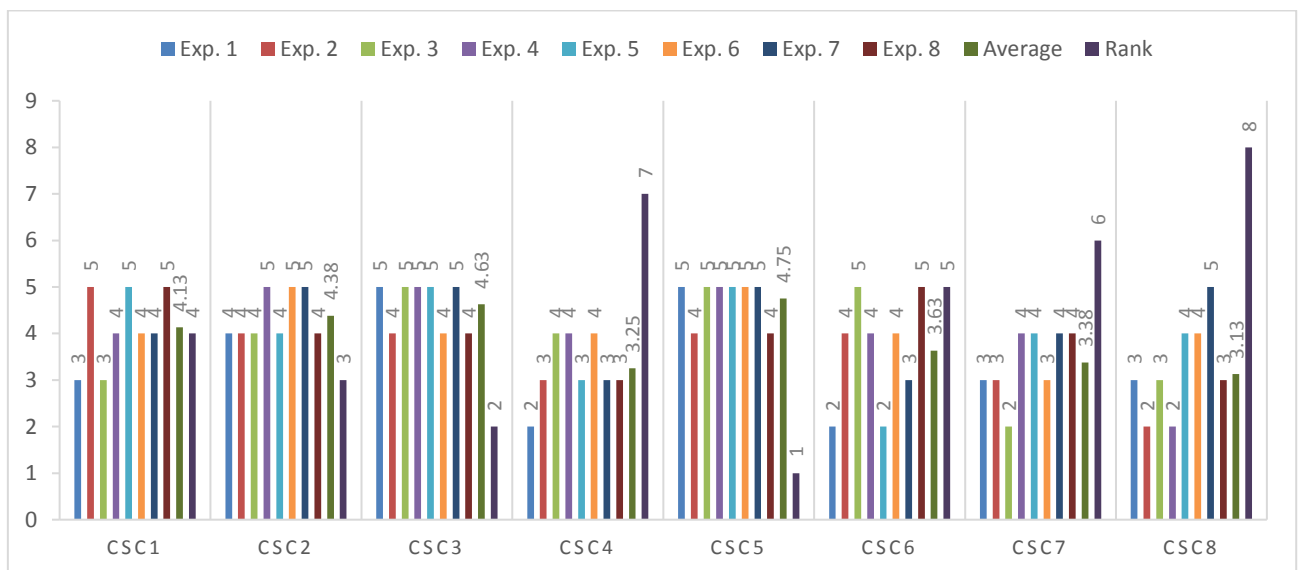


Figure 5. Cost sub-criteria ranking

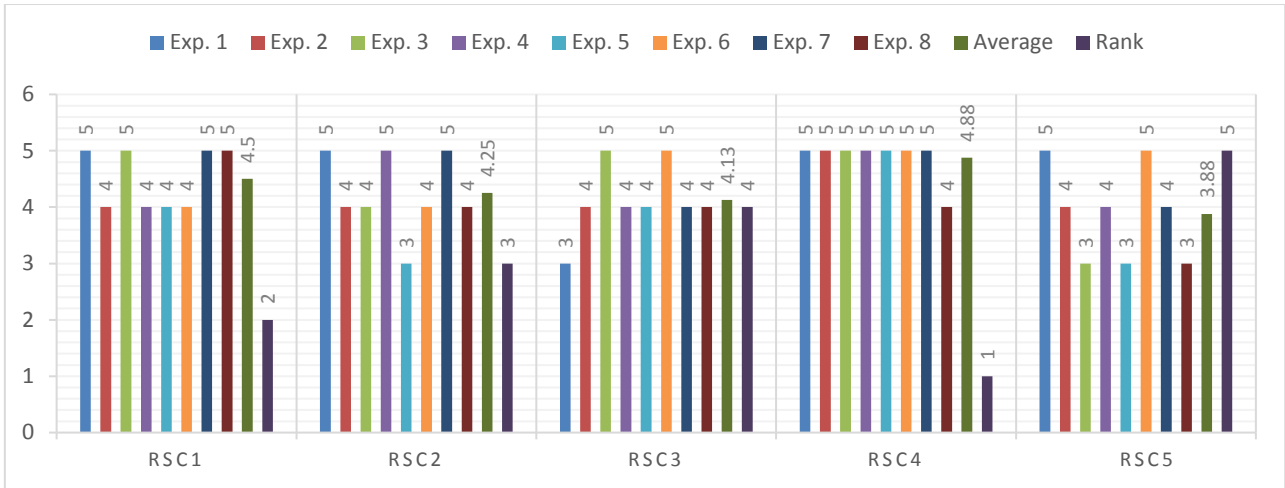


Figure 6. Resource sub-criteria ranking

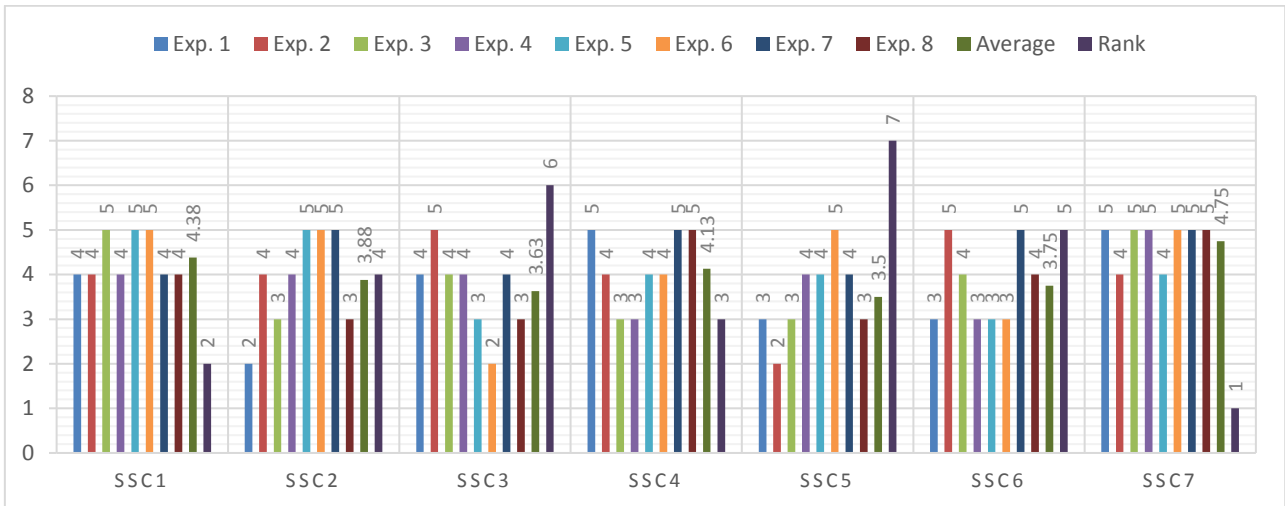


Figure 7. Safety sub-criteria ranking

The results of sub-criteria ranking showed that, in the organization and management criteria, promptly resolve any issues after notification (OMSC4) is most important. In time criteria, the adequacy of initial project schedule (TSC2) is most important. In quality criteria, the compliance with plans and specifications (QSC5) is most important. In cost criteria, the practices change order avoidance and minimization (CSC5) is most important. In resource criteria, the Adjust resources in response to demands of the project delivery schedule (RSC4) is most important. In safety criteria, the Minimizes job-site accidents (SSC7) is most important.

3.2. Determine comparative significance (Sj) and weights (Wj) for main criteria

The second stage is similar to the first stage. Again, the criteria importance order was obtained as in the first stage form, decision makers made their own pair wise comparisons, but instead of taking the average of the weight values at the end of the SWARA Method, the process was continued by taking the average of the pairwise comparisons (sj) by application equation 1. The process and results are presented in Table 2.

Table 2. Relative importance assessment for main criteria

Experts	Main criteria relative importance				
	TMC↔CMC	QMC↔TMC	OMMC↔QMC	RMC↔OMMC	SMC↔RMC
1	0.5	0.5	0.3	0.6	0.2
2	0.4	0.4	0.5	0.5	0.5
3	0.5	0.4	0.6	0.4	0.4
4	0.4	0.6	0.5	0.6	0.3

Experts	Main criteria relative importance				
	TMC↔CMC	QMC↔TMC	OMMC↔QMC	RMC↔OMMC	SMC↔RMC
5	0.6	0.4	0.4	0.6	0.5
6	0.5	0.5	0.4	0.5	0.5
7	0.5	0.5	0.5	0.3	0.6
8	0.4	0.6	0.5	0.5	0.4
Av.value	0.475	0.488	0.463	0.500	0.425

After completing the (S_j) comparison between the primary criteria using equation 1, The next step is to use the equations 2, 3, and 4 to calculate the primary criteria weights. Table (3) show the main criteria weighting by using the SWARA.

Table 3. Main criterion weights

M. C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
CMC	---	1.0	1.0	35.7
TMC	0.475	1.475	0.678	24.2
QMC	0.488	1.488	0.456	16.3
OMMC	0.463	1.463	0.312	11.2
RMC	0.500	1.500	0.208	7.4
SMC	0.425	1.425	0.146	5.2
			$\sum = 2.800$	$\sum = 100$

3.3. Calculate sub criteria significance (S_j) and weights (W_j)

This stage is similar to the stage in section 3.2. Again, the sub-criteria importance order was obtained form, decision makers made their own pair wise comparisons. Table 4 show relative importance assessment for organization and management sub-criteria.

Table 4. Relative importance assessment for organization and management sub-criteria

Experts	O&M Sub criteria relative importance						
	OMSC3↔ OMSC4	OMSC1↔ OMSC3	OMMC6↔ OMMC1	OMSC2↔ OMSC6	OMSC5↔ OMSC2	OMSC7↔ OMSC5	OMSC8↔ OMSC7
1	0.4	0.4	0.7	0.4	0.3	0.7	0.3
2	0.4	0.5	0.7	0.5	0.4	0.4	0.6
3	0.4	0.6	0.7	0.5	0.6	0.4	0.5
4	0.5	0.4	0.5	0.5	0.5	0.5	0.4
5	0.5	0.4	0.6	0.5	0.3	0.6	0.4
6	0.5	0.5	0.7	0.5	0.7	0.4	0.5
7	0.6	0.5	0.5	0.5	0.4	0.5	0.6
8	0.5	0.6	0.3	0.5	0.7	0.3	0.5
Av.value	0.475	0.488	0.588	0.488	0.488	0.475	0.475

The calculation of the organization and management sub-criteria weights shown in table 5.

Table 5. Weights of organization and management sub-criteria

M. C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
OMSC4	---	1.0	1.0	34.6
OMSC3	0.475	1.475	0.678	23.4
OMSC1	0.488	1.488	0.456	15.8
OMSC6	0.588	1.588	0.287	9.9
OMSC2	0.488	1.488	0.193	6.7
OMSC5	0.488	1.488	0.130	4.5
OMSC7	0.475	1.475	0.088	3.0
OMSC8	0.475	1.475	0.060	2.1
			$\sum = 2.892$	$\sum = 100$

Table 6 show relative importance assessment for time sub-criteria.

Table 6. Relative importance assessment for time sub-criteria

Experts	Time Sub criteria relative importance				
	TSC1 \leftrightarrow TSC2	TSC3 \leftrightarrow TSC1	TSC4 \leftrightarrow TSC3	TSC5 \leftrightarrow TSC4	TSC6 \leftrightarrow TSC5
1	0.4	0.5	0.4	0.5	0.6
2	0.5	0.5	0.4	0.3	0.6
3	0.6	0.4	0.5	0.5	0.6
4	0.5	0.6	0.5	0.3	0.4
5	0.4	0.3	0.6	0.5	0.5
6	0.5	0.4	0.7	0.5	0.4
7	0.5	0.5	0.3	0.6	0.6
8	0.4	0.6	0.4	0.7	0.3
Av.value	0.475	0.475	0.475	0.488	0.5

The calculation of the time sub-criteria weights shown in table 7.

Table 7. Weights of time sub-criteria

M. C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
TSC2	---	1.0	1.0	35.7
TSC1	0.475	1.475	0.678	24.2
TSC3	0.475	1.475	0.460	16.4
TSC4	0.475	1.475	0.312	11.2
TSC5	0.488	1.488	0.210	7.5
TSC6	0.500	1.500	0.140	5.0
			$\sum = 2.8$	$\sum = 100$

Table 8 show relative importance assessment for quality sub-criteria.

Table 8. Relative importance assessment for quality sub-criteria

Quality Sub criteria relative importance									
Exp.	QSC2↔	QSC1↔	QSC10	QSC3↔	QSC4↔	QSC7↔	QSC6↔	QSC8↔	QSC9↔
	QSC5	QSC2	↔QSC1	QSC10	QSC3	QSC4	QSC7	QSC6	QSC8
1	0.4	0.6	0.5	0.3	0.5	0.6	0.4	0.6	0.6
2	0.5	0.6	0.5	0.5	0.4	0.6	0.5	0.6	0.5
3	0.5	0.4	0.5	0.5	0.6	0.5	0.7	0.5	0.5
4	0.6	0.5	0.5	0.4	0.4	0.7	0.5	0.5	0.4
5	0.4	0.6	0.4	0.6	0.4	0.4	0.5	0.6	0.4
6	0.5	0.5	0.3	0.6	0.5	0.5	0.6	0.3	0.5
7	0.5	0.3	0.7	0.4	0.6	0.3	0.5	0.5	0.6
8	0.5	0.4	0.5	0.6	0.5	0.3	0.6	0.4	0.4
Av.v alue	0.488	0.488	0.488	0.488	0.488	0.488	0.538	0.500	0.488

The calculation of the quality sub-criteria weights shown in table 9.

Table 9. Weights of quality sub-criteria

M.C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
QSC5	---	1.0	1.0	33.5
QSC2	0.488	1.488	0.672	22.5
QSC1	0.488	1.488	0.452	15.0
QSC10	0.488	1.488	0.304	10.3
QSC3	0.488	1.488	0.204	6.9
QSC4	0.488	1.488	0.137	4.5
QSC7	0.488	1.488	0.092	3.0
QSC6	0.538	1.538	0.060	2.0
QSC8	0.500	1.500	0.04	1.4
QSC9	0.488	1.488	0.027	0.09
			$\sum = 2.961$	$\sum = 100$

Table 10 show relative importance assessment for cost sub-criteria.

Table 10. Relative importance assessment for cost sub-criteria

Cost Sub criteria relative importance							
Experts	CSC3↔	CSC2 ↔	CSC1 ↔	CSC6 ↔	CSC7 ↔	CSC4 ↔	CSC8 ↔
	CSC5	CSC3	CSC2	CSC1	CSC6	CSC7	CSC4
1	0.5	0.4	0.4	0.3	0.5	0.3	0.6
2	0.5	0.5	0.7	0.4	0.6	0.5	0.3
3	0.5	0.4	0.3	0.7	0.4	0.7	0.4
4	0.5	0.5	0.4	0.5	0.7	0.5	0.3
5	0.5	0.4	0.6	0.3	0.5	0.4	0.6
6	0.4	0.6	0.3	0.5	0.4	0.6	0.5
7	0.5	0.5	0.4	0.4	0.4	0.4	0.7
8	0.5	0.5	0.6	0.5	0.6	0.4	0.5
Av.value	0.488	0.475	0.463	0.450	0.513	0.475	0.488

The calculation of the cost sub-criteria weights shown in table 11.

Table 11. Weights of cost sub-criteria

M. C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
CSC5	---	1.0	1.0	33.8
CSC3	0.488	1.488	0.672	22.7
CSC2	0.475	1.475	0.456	15.5
CSC1	0.463	1.463	0.312	10.5
CSC6	0.450	1.450	0.215	7.3
CSC7	0.513	1.513	0.142	4.8
CSC4	0.475	1.475	0.096	3.2
CSC8	0.488	1.488	0.065	2.2
			$\sum = 2.958$	$\sum = 100$

Table 12 show relative importance assessment for resource sub-criteria.

Table 12. Relative importance assessment for resource sub-criteria

Experts	Resource Sub criteria relative importance			
	RSC1 ↔ RSC4	RSC2 ↔ RSC1	RSC3 ↔ RSC2	RSC5 ↔ RSC3
1	0.5	0.5	0.3	0.7
2	0.4	0.5	0.5	0.5
3	0.5	0.4	0.6	0.3
4	0.4	0.6	0.4	0.5
5	0.4	0.3	0.6	0.4
6	0.4	0.5	0.7	0.5
7	0.5	0.5	0.4	0.5
8	0.7	0.4	0.5	0.3
Av.value	0.475	0.463	0.500	0.463

The calculation of the resource sub-criteria weights shown in table 13.

Table 13. Weights of resource sub-criteria

M.C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
RSC4	---	1.0	1.0	37.6
RSC1	0.475	1.475	0.678	25.5
RSC2	0.463	1.463	0.463	17.4
RSC3	0.500	1.500	0.309	11.6
RSC5	0.463	1.463	0.211	7.9
			$\sum = 2.661$	$\sum = 100$

Table 14 show relative importance assessment for safety sub-criteria.

Table 14. Relative importance assessment for safety sub-criteria

Experts	Safety Sub criteria relative importance					
	SSC1↔ SSC7	SSC4↔ SSC1	SSC2↔ SSC4	SSC6↔ SSC2	SSC3↔ SSC6	SSC5↔SSC 3
1	0.4	0.6	0.2	0.6	0.6	0.4
2	0.5	0.5	0.5	0.6	0.5	0.2
3	0.5	0.3	0.5	0.6	0.5	0.4
4	0.4	0.4	0.6	0.4	0.6	0.5
5	0.7	0.4	0.7	0.3	0.5	0.6
6	0.5	0.4	0.6	0.3	0.4	0.7
7	0.3	0.6	0.5	0.5	0.4	0.5
8	0.4	0.7	0.3	0.6	0.3	0.5
Av.value	0.463	0.488	0.488	0.488	0.475	0.475

Table 15 shows how the weights of the safety sub-criteria were calculated.

Table 15. Weights of safety sub-criteria

M.C	$S_{j \leftrightarrow j+1}$	$K_j = S_j + 1$	$q_j = q_{j-1} / k_j$	$W_j = q_j / \sum q_j$
SSC7	---	1.0	1.0	34.5
SSC1	0.463	1.463	0.684	23.6
SSC4	0.488	1.488	0.460	15.8
SSC2	0.488	1.488	0.309	10.7
SSC6	0.488	1.488	0.208	7.2
SSC3	0.475	1.475	0.141	4.9
SSC5	0.475	1.475	0.096	3.3
			$\sum = 2.898$	$\sum = 100$

3.4. Final weights of main criteria and sub criteria

Final results of weights for main criteria and sub-criteria by using the SWARA technique illustrated by Table 16.

Table 16. The final weight for companies' performance evaluation criteria

Main Criteria	Wight	Sub-criteria	Weight
Cost	35.7	Avoiding and minimizing change orders	33.8
		Accuracy of payrolls and other required documentation	22.7
		Laws and regulations compliance and early payment	15.5
		Follow the contract's Labor Standards/Wage-Rate requirements	10.5
		Documentation of the change order	7.3
		pricing of the change order	4.8
		Identify changes as were needed, not at the end of the task or project	3.2
Time	24.2	Timely performs change order work	2.2
		Initial project schedule suitability	35.7
		Schedule the work and follow it	24.2
		Observance of the agreed-upon schedule	16.4
		Timeliness and accuracy of schedule updates	11.2
		Adherence to recovery schedule and timely submittal	7.5
Quality	16.3	Notification of changes to the schedule in a timely manner	5.0
		Plan and specification adherence	33.5
		Provide an effective inspection and quality control procedures	22.5
		Meet the contract requirements	15.0
		Timely correction of deficient work	10.3
		Workmanship quality	6.9
		Work Quality of Subcontractors	4.5
		Implementation of the QA/QC Plan	3.0
		QA/QC Plan Adequacy	2.0
QA/QC Documentation	1.4		
Organization and Management	11.2	Adequacy of Materials	0.9
		Promptly resolve any issues after notification	34.6
		Participate in the settlement of project issues.	23.4
		Cooperation/Responsiveness with project staff, client and representatives	15.8
		Carry out activities in a timely manner that does not disrupt other people's work or cause harm to their property.	9.9
		Follow chain of authority and comply with directions	6.7
		Actively and cooperatively meet expectations on project coordination	4.5
		Any issues that arise are quickly resolved.	3.0
		Work with subcontractors to exercise authority, coordinate, and supervise work operations to ensure the timeline and requirements are met	2.1
		Resources	7.4
Enough equipment to finish the job on time.	25.5		
Personnel who are both competent and sufficient to accomplish the assignment on time.	17.4		
All of the equipment complies with or exceeds the specifications.	11.6		
Trained and Skilled Workforce	7.9		
Safety Practices	5.2	Minimizes job-site accidents	34.5
		Take the initiative to ensure the health and safety of the employees	23.6
		Take adequate precautions with any hazardous materials	15.8
		The safety equipment is in perfect working order.	10.7
		Conduct the Periodic audits of compliance	7.2
		Follow good safety practices	4.9
Properly report all injuries or damage associated with project	3.3		

4. Conclusions

This study presented the SWARA technique to prioritize performance evaluation criteria. The SWARA tool play a significant impact in the making of a decision and to compute the final weighted values of performance criteria. This study identified six main criteria and forty-four sub criteria that directly influence the success of construction firms, and they could be utilized by practitioners in the Iraqi construction business to better assess the company's performance. As the Iraqi construction market grows, the conclusions of this study will aid international corporations in understanding the success criteria by which Iraqi construction firms are measured. The findings of this study can help guide the process of evaluating the performance of construction firms. The findings of this study demonstrate that the most important criteria in evaluating the construction companies' performance is cost, followed by time, quality, organization and management, resources, and lastly safety practices. The worth of this paper is to assist in determining the performance of companies in construction sector as well as the relative importance of decision criteria in measuring the performance of Iraqi construction sector companies using the SWARA technique.

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