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Procurement Management of Power Plants Construction Projects in Iraq

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ABSTRACT

The government of Iraq states that despite the massive amounts invested in the power generating sector, the country has been plagued by power outages for more than three decades; One of the most common sources of the problem and significant impact on the waste of public funds in contractual processes. The Ministry of Planning issued the sectorial specialized standard bidding documents (SSBD) of Design, Supply, and Installation of the Electromechanical Works (DSIoEW), which is primarily designed to support the Ministry of Electricity (MoE) by developing economic projects to improve the contractual process that led to raisings Iraqi electricity generation field. The research evaluates the impact of applying the SSBD-DSIoEW for governmental power generation plants and investigates the challenges and obstacles of SSBD-DSIoEW applications in Iraq by conducting preliminary interviews with procurement experts and distributing 120 questionnaires to MoE's contractual staff. The results show a lack of experience in applying the evaluation and qualification criteria under SSBD-DSIoEW, and inadequate bid evaluations, resulting in an ineffective procurement system. In the study's conclusion and based on the results, the authors developed a unified bids evaluation model. They structured it in a computerized application program to support bids' evaluation committees.

Keywords: Sectorial Standard Bidding Document, Evaluation and Qualification Criteria, Power Plant, Electromechanical Works,

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إدارة التعاقدات لمشاريع انشاء محطات انتاج الطاقة الكهربائية في العراق

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الخلاصة

صرحت الحكومة العراقية انه على الرغم من المبالغ الضخمة التي تم استثمارها في قطاع انتاج الطاقة الكهربائية فقد عانى البلاد من انقطاع التيار الكهربائي لأكثر من ثلاثة عقود وكانت الإجراءات التعاقدية من الأسباب الرئيسية ولها تأثير كبير في هدر المال العام. أصدرت وزارة التخطيط وثائق العطاءات القياسية القطاعية التخصصية لتصميم وتجهيز وتركيب الأعمال الكهروميكانيكية، والتي تم تصميمها بشكل أساسي لدعم وزارة الكهرباء من خلال تطوير مشاريع اقتصادية لتحسين العملية التعاقدية التي ستؤدي إلى رفع مجال انتاج الطاقة الكهربائية في العراق. يقوم البحث بتقييم تأثير تطبيق الوثيقة القطاعية التخصصية لمشاريع انشاء المحطات الطاقة الكهربائية الحكومية في العراق وتقييم التحديات والعقبات التي تواجه الجهات التعاقدية (وزارة الكهرباء) في تطبيق الوثيقة القطاعية في العراق من خلال إجراء مقابلات أولية مع خبراء التعاقدات وتوزيع 120 استبيانًا على موظفي التعاقدات في وزارة الكهرباء. اظهرت النتائج هناك نقص في الخبرة في تطبيق معايير التقييم والتأهيل بموجب الوثيقة القطاعية، وعملية تقييم العطاءات لم تكن متوازنة، مما أدى إلى نظام تعاقدات غير فعال. وفي ختام الدراسة وبناءً على النتائج طور المؤلفون نموذجاً موحداً لتقييم العطاءات وتم تنظيمه في برنامج تطبيقي محوسب لدعم لجان تقييم العطاءات.

.**الكلمات الرئيسية:** الوثيقة القياسية القطاعية , معايير التقييم والتأهيل , محطات انتاج الطاقة الكهربائية ,الإعمال الكهروميكانيكية

1. INTRODUCTION

The public procurement system is one of the main pillars in the fight against administrative and financial corruption that the government of Iraq suffers from. The government of Iraq spent billions of dollars in the power generation field, and it was enough to construct modern power generation plants with specifications comparable to power plants in developed countries, but corruption, financial waste, and mismanagement prevented this from being addressed so the crisis in the electric power generation projects in continues. Ministry of Planning (MoP), in cooperation with the World Bank and international agencies, issued more than twenty standard bidding documents (SBDs) to raise the level of qualitative and specialized contracts, along the lines of what is internationally enforced, to achieve the principle of transparency and integrity, and it has mandated since July 2016 for the governmental contracting entities to apply the SBDs for implementing the investment projects funded by the federal budget. Several previous studies were surveyed (international and local), focusing on the project management of the construction industry, the impact of procurement management on project success, standard contract forms, project delivery methods, and risk management in procurement. At the same time, there is no specific research related to the SSBD-DSIoEW and its impact on construction industry projects.

The SSBD-DSIoEW is designed to meet the Ministry of Electricity (MoE) requirement in the electricity generation field. Due to the novelty of the SSBD-DSIoEW, it has become necessary to conduct a continuous follow-up to determine the most important challenges facing the SSBD-DSIoEW applications. The issues that will be addressed and handled in this research are "the challenges and obstacles that impact the proper application of the SSBD-DSIoEW for industrial construction projects such as power generation plants in Iraq".

1.1 The Statement of the Problems

The SSBD-DSIoEW is a new bidding document that supports MoE by developing economic projects that leads to raisings in the Iraqi electricity generation sector. "The hypothesis of the research can be consolidated as follow:

1. The SSBD-DSIoE is a new document, and its nature is intended only for industrial construction projects;
2. There is a negative correlation between SSBD-DSIoEW and risks for cost, time, quality, and environmental aspects in the construction of industrial projects.
3. Exceptions issued by the Council of Ministers (CoM) that impede optimal implementation of the SSBD-DSIoE, while the SSBD-DSIoE is considered one of the top worldwide practices in the area of industrial project contracting;
4. The lack of qualified experienced contractual staff to deal with the SSBD-DSIoEW; and.
5. The requirement of developing new controls and procedures by MoP to support the contracting entities in SSBD-DSIoEW applications, especially with its evaluation criteria.

1.2 Research Objectives

The objectives of the study are to:

1. Assessing the abilities of the public contracting entities and the contractual staff regards the application of SSBD-DSIoEW for industrial infrastructure projects such as power generation plants;
2. Investigating the challenges and obstacles during the bids' evaluation stage under the SSBD-DSIoEW and its impact on the implementation of the industrial construction projects; and.
3. Supporting the contracting entities in the bids evaluation stage by developing a proposed bids evaluation model with a computerized application program for the design-build projects, especially industrial construction projects, the proposed program will support the contracting entities in conducting bids opening, prequalification, preliminary evaluation of bids, and detailed evaluation of bids.

2. REVIEW OF LITERATURE

Procurement management is an essential element that must be performed during the whole life cycle of the contract. Implementations constitute different tasks and priorities throughout the different phases. The term procurement is a general term representing all the client's tasks required to construct or refurbish a building **(Joint Contracts Tribunal 2011)**. Procurement management's ultimate goal to be successful is to provide the required product, goods, and/or services on time and in a cost-effective way. According to **(Garrett, 2010)** and **(Morris and Pinto, 2010)**, project procurement management includes the processes required to outsource products, goods, and/or services. It includes all contract management and purchase order required. Sustainable procurement management (SPM) as an approach to integrating sustainability into project procurement takes into account the social, ecological, and economic consequences of procurement decisions. Several challenges hinder the proper achievement of SPM objectives in the construction industry.

In the research by **(Eriksson et al. 2017),** the construction industry was characterized by interdisciplinary, fragmented, and temporary project organizations and process

discontinuities, which make construction highly dependent on governance and procurement. Lately, there has been an increased interest in research in construction procurement, for example, on client procurement strategies. **(Jackson, 2020)** stated that the construction industry sector is highly specialized, firms with extensive construction and engineering knowledge are required, and few qualified contractors operate in the industrial sector. The project types listed in this category are essentially determined by the production activities within the facility, as power plants, oil refineries, and chemical processing plants are all examples of industrial construction projects. In the work by **(Ashkanani et al., 2022),** industrial megaprojects encounter multiple problems in various sectors and phases, which often result in issues and failures in the areas of economics, operations, social, environmental, and political concerns. The successful implementation of a competent management system has been the subject of several academic research and increased the success of megaprojects **(Al-Ageeli, and Alzobaee, 2016)**. Megaprojects need meticulous management, with both the customer and the contractor being open and responsive to open records requests. Megaprojects are typically difficult to manage due to their scale, complexity, uniqueness, and technology and innovation levels. It has unique characteristics, such as a long time horizon, various sources of uncertainty, and a significant risk of corruption **(Delatte, 2017), (Erzaij, 2016), and (Aljanabei, 2016)**.

The procurement strategy refers to the identification of the organizational and contractual procedures that are required for the successful completion of a certain project **(Flanagan and Jewell, 2018)**.

(Hamza et al., 2022) showed that according to the Coalition Provisional Authority's Order No. 87 (2004) and the regulation of executing governmental contracts in Iraq, government procurement is defined as the purchase of goods and services by the Iraqi government represented by ministries and provinces and any other entities funded by the Republic of Iraq that have the authority to spend public funds. Construction contractor selection procedures are fundamentally different from service contract selection approaches. Several kinds of construction contracts are available today, but the choice of the contract is determined by budget and contract strategy. In most situations, construction work is given primarily via competitive bidding. The project owner uses this technique to encourage prospective contractors to compete for a project by tendering bids. The bidder with the lowest quoted price **(Arditi, 2016).** According to World Bank (2022), Iraq is one of the most reliant on oil. Over the past ten years, oil profits have made up 99% of exports, 85% of the government budget, and 42% of the country's GDP. **(Altai et al., 2022)** stated that Iraq's electricity industry needs immediate improvements. Industry and academics are concerned about the system's capacity to supply stable electricity and operational inefficiencies. The electricity sector is witnessing one of the world's biggest demand growth, making up a substantial portion of Iraq's government capital investment program. The objective of this study can be summarized by assessing the MoE's approach to SSBD-DSIoEW applications and investigating the challenges and obstacles of its application in the environment of the public procurement system.

3. SSBD-DSIoEW

Bidding for government contracts is inherently complicated. Because of the confusing and inefficient bidding procedure in Iraq, this complexity was increased. The approach was the same despite the project size, whether it was a multi-million-dollar construction project or a small one. Furthermore, the evaluation criteria were unclear and easily influenced, with the lowest price being the deciding criterion for winning **(Hasan and Mohammed, 2020)**. On 24 February **(the Ministry of Planning, 2016)** published all types of SBDs for contractual entities of contracting parties in Iraq, and they entered into effect on 1 July 2016. The Government of Iraq, represented by **The MoP**, issued instructions and controls to support the execution of power plant projects by adopting the SSBD-DSIoEW to support the Ministry of Electricity in enhancing economic projects that led to the raisings of the electricity generation sector in Iraq.

The SSBD-DSIoEW has been certified for use in the Design, Supply, and Installation of Electromechanical Works for infrastructure projects where the following conditions are met:

1. The contract covers the design, handover, construction, installation, and operation of specially engineered factories and equipment such as turbines, generators, switchyards, pumping stations, telecommunications, treatment factories, and similar energy, water, and sanitation projects.
2. The value of the plant and equipment must account for the majority of the expected contract value, and
3. The plant and equipment's type and degree of complexity need rigorous pre-commissioning and operation and compliance with acceptance processes before the contracting entity may safely take over the facilities.

Fig. 1 below summarizes the basic contractual structure using design, supply, and installation of plants, and **Fig. 2** shows a structure flow chart for the procurement process for the power plant in Iraq, while **Fig. 3** illustrates the bids evaluation processes and procedures under the SSBD-DSIoEW.

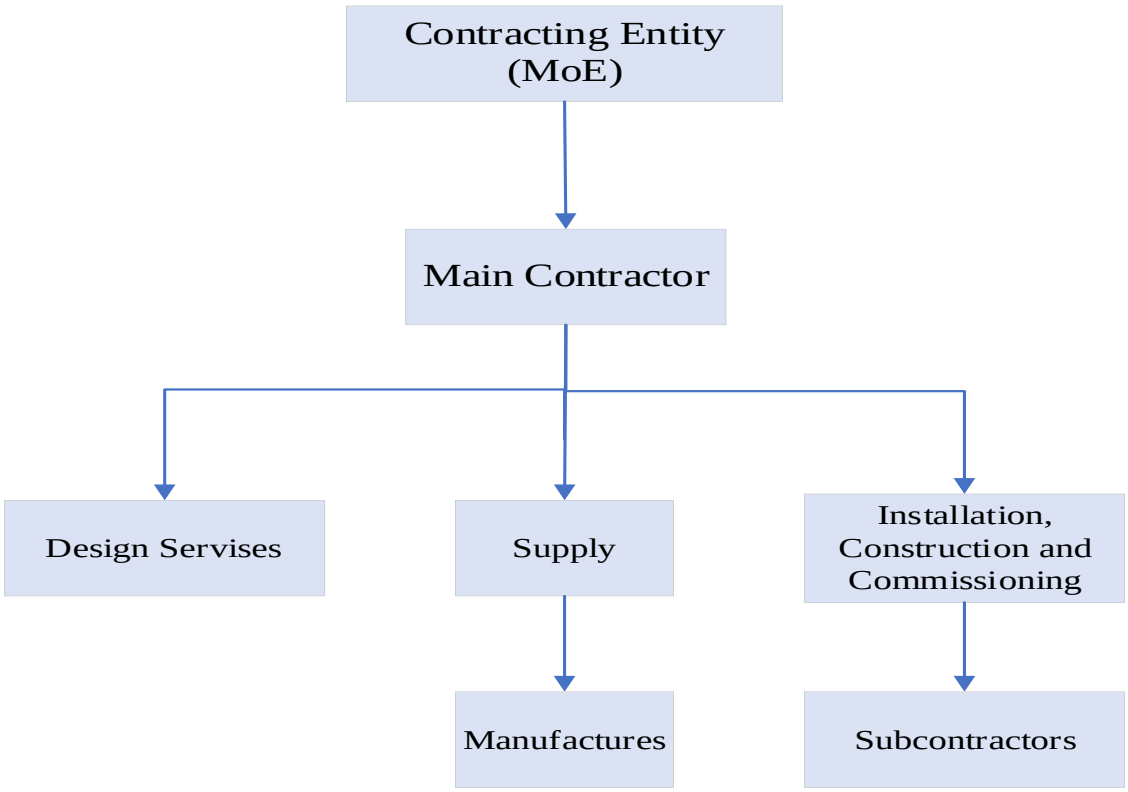


Figure 1. The basic contractual structure under SSBD-DSIoEW

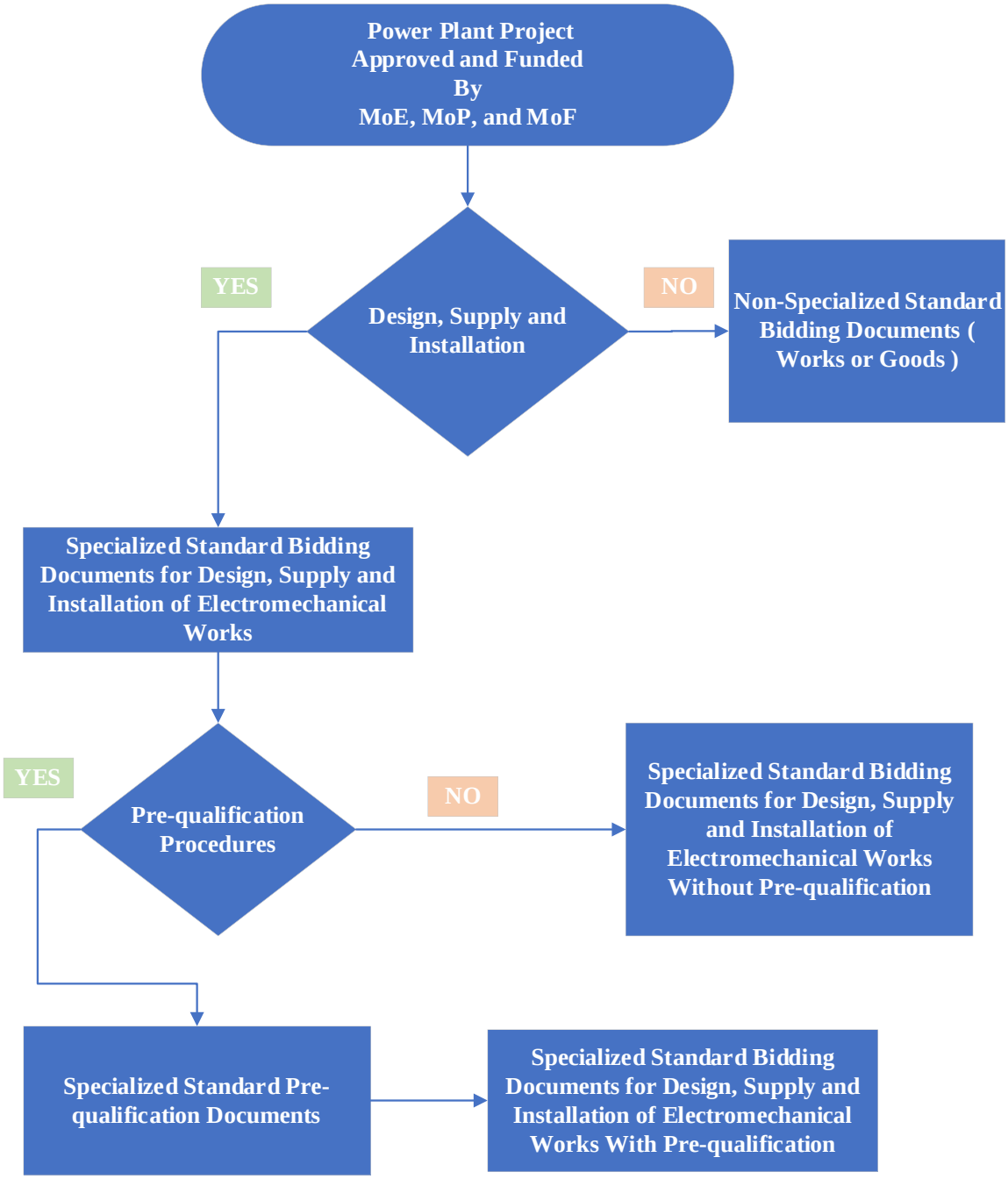


Figure 2. Basic Structure flow chart for the procurement process for the power plant in Iraq

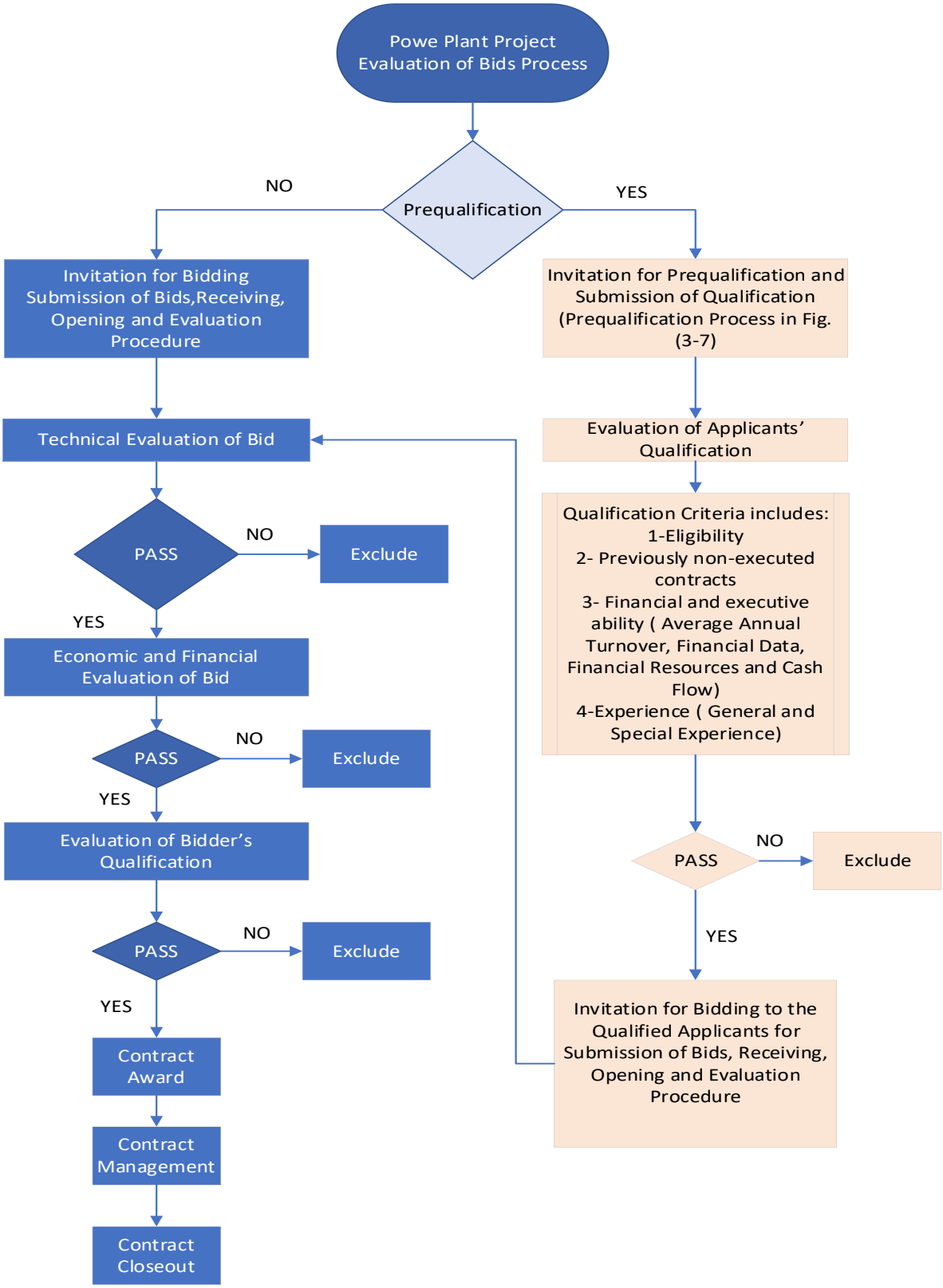


Figure 3. SSBD-DSIoEW bids evaluation processes

4. RESEARCH METHODOLOGY

The survey was performed to gather the necessary information to apply the theoretical aspects into practice from a wide range of sources, including books, journals, studies, and significant papers, whether they were available locally or internationally, on the Internet, or in paper form. To gather the required data to fulfill the study's objectives and contribute to evaluating the survey model's underlying assumptions. The research employed the following methods to gather the information needed for the study:

1. Interviews with participants of the study model; MoP's Deputy, The General Director for the Directorate of Government Contracts in Iraq, General Directors and official contractual staff from MoE, provinces, academic professors, and the National Investment Commission, in addition to a large number of private sectors, to clarify the paragraphs of the questionnaire in case of need to ensure the correct answer.
2. The questionnaire is a key instrument in the data-collecting process due to its formulation and capacity to diagnose and assess the study's dimensions. Since there is not ready-made tool that allows authors to compare theoretically derived study variables with field studies, the questionnaire's contents and its analysis in more detail below. Questionnaires are an essential research instrument; Decision-makers and authors from various academic and industrial sectors conduct surveys and questionnaires to get answers to particular, relevant inquiries. Indeed, questionnaires and surveys may be useful methods for gathering data for study and assessment **(Taherdoost 2019).**

4.1 Interviews

The authors, through interviews with official public staff from MoP, MoE, and other contractual staff from ministries and provinces, in addition to the interviews with the private sector, regarding adopting and applying the SBD in general and the SSBD of plant in the special case to investigate the obstacles and challenges in implementing the government contracts and its impact on the investment plan, the findings of the interviews with stakeholders, they mention that there are international agencies works with MoP on the reform of governmental contracts lesligation and procedures. The authors found out:

1. Despite the critical role government contracts play in executing governmental projects, no overarching legislation exists (Contracts Law) to control them in a way that is flexible enough to meet the requirement of contracting entities (ministries, provinces, and entities not associated with a ministry);.
2. The current Contracts Law (**the Dissolved Coalition Provisional Authority Order No. 87 of 2004**) is still in effect, although it contains provisions that are insufficient and do not meet major developments in the field of contracts, as well as provisions that violate the constitution, such as the issue of forming an administrative court in the Ministry of Planning, which is inconsistent with the principle of separation of powers, which prompted the current Contracts Law to be enacted.
3. The legislation regulating government contracts in force at present is scattered legislation and is based on more than one law; therefore, it must be unified under one law (Contracts Law).
4. Annual routine problems related to delays in issuing the federal budget;

5. Most government contracts are contracts of compliance in terms of rights and duties;
6. Most of the contractual terms that achieve the actual balance of rights and duties between the two parties have been suspended, such as the termination of the contract by the contractor and compensation due to the delay in the payment of dues and price escalation ;
7. The non-implementation of the price adjustment procedures stipulated in the standard documents, and because of the country's economic situation and price fluctuations, made many sober companies not bid on government tenders;
8. Lack of qualified contractual staff, Despite the many development programs (Capacity Building), carried out by the Ministry of Planning;
9. Absence of standard procurement process and annual contracting plan;
10. Exceptions issued by the Iraqi government somewhat affect the transparency and justice in the implementation of government contracts;.
11. Contracting entities do not use the international or national competitive bidding method in procurement; they use direct invitation or direct contracting not under the right conditions;

4.2 Questionnaire survey

The questionnaire was developed to enable easy answers to the questions by most respondents. It was distributed to the management staff in the various hierarchal levels of public contracting entities to ensure that the survey would not be subjected to bias. **Table 1** shows the three sections of the questionnaire.

Table 1. Questionnaire structure

Section No.	Objectives
Section 1	Respondents' general information
Section 2	Respondents' general experience with SBDs applications
Section 3	Respondents' specialized experience with SSBD of design, supply, and installation of electromechanical works

Based on previous, studies shows that the Likert scale is an effective and vastly applied tool in research measuring survey answers. Respondents were asked to score the impact of each criterion on a 5-point Likert scale, with 5 being the highest score, with 1 being Strongly disagreed, 2 being Disagree, three being Neither agree nor disagree, four being Agree and five being Strongly agreed.

4.2.1 Sample size

A total of 120 questionnaires were distributed into five classes according to the Ministry of Electricity (MoE) organizational structure, which includes thirteen general companies (Production, Distribution, and Transmission) in addition to MoE's headquarters, with 100 respondents returning, as shown in **Table 2** the profile of the respondent based on their region and focusing on the general production companies and 89 were valid for statistical

analysis. The survey covered all Iraqi regions from north to south except the Kurdistan region.

Table 2. The profile of the respondent.

MoE's Entities (Generation, Distribution, and Transmission)	Distributed	Collected
MoE- Headquarter	20	16
MoE's Middle General Companies	30	23
MoE's Northern General Companies	25	21
MoE's Southern General Companies	20	17
MoE's Middle Euphrates General Companies	25	23
Total	120	100

4.2.2 Questionnaire survey analysis

The reliability analysis was conducted to check the internal consistency of the study variable records by applying Cronbach's alpha technique as Eq. (1). According to recommendations from experts, Cronbach's alpha value should be at least 0.70 to signify that a given questionnaire has enough internal consistency. For a specific questionnaire, a low Cronbach's alpha value (below 0.7) indicates weak internal consistency and thus poor inter-relatedness across questions. The internal consistency coefficient for a certain questionnaire, Cronbach's alpha, and the level of questionnaire reliability are shown in Table 3 below.

$$\propto = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{k} \sigma_{yi}^2}{\sigma_x^2}\right) \quad (1)$$

where:

K= Number of factors

σ_x^2=Variance of the total scores for the respondent

σ_{yi}^2=Variance of component i for the respondents

The below result confirms the validity and stability of the data collection scale, and **Table 4** shows Cronbach's alpha

It is clear from the results that all stability coefficients of the research variables are highly accepted in engineering and technical terms. **Table 5** shows the frequency distribution of the response measurement, mean, and the relative importance index for each question in the questionnaire according to equation (2) for computing the mean and equation (3) for the relative importance index (RII)

$$Arthemitic\ Mean = \left(\frac{\sum Xi}{N}\right) \quad (2)$$

where: n= stud y number of years, xi = total data taken

Table 3. The idea of the value of Cronbach's alpha with the degree of reliability

(Robinson, 2009) and (Taherdoost, 2016)

S. No.	Value of Cronbach's alpha (α)	Degree of Reliability
1	$\alpha \leq 0$	A serious problem in the design of the questionnaire and the researcher should relook into the format of the questionnaire intended to use for the survey.
2	$0 < \alpha < 0.5$	Low internal consistency and hence poor inter-relatedness between items. Should be discarded or revised.
	$0.5 < \alpha < 0.7$	Moderate internal consistency and reliability of a given questionnaire. Can be revised.
3	$\alpha = 0.7$	Adequate internal consistency and reliability of a given questionnaire.
4	$0.7 < \alpha < 0.9$	High internal consistency and reliability in a given questionnaire. Can be revised.
5	$0.9 < \alpha < 1.0$	Some questionnaire items may be redundant and the researcher has to consider removing some items from the questionnaire that are repeated questions in multiple ways.
6	$\alpha = 1.0$	Perfect internal consistency in a given questionnaire

Table 4. Survey coefficient for Cronbach's alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items	Sector
0.827	0.840	23	Public

$$RII(\%) = \left(\frac{\sum W}{N * A}\right) * 100 \quad (3)$$

where: W = weighting as assigned on Likert's scale by each respondent in a range from 1 to 5; A = Highest weight (here it is 5), and N =Total number in the sample.

The weighted value(mean) equals three (3) is the average weight of the scale [(1+2+3+4+5)/5] = 3. Thus, the authors used this as a criterion for measuring and evaluating the scores gained via the answers of the respondents.

Table 5: Frequency distribution, arithmetic mean, standard deviation, and relative importance index

Descriptive Statistics								
ID	Questions	Respondent Measurement - Frequencies					Mean	Relative Importance Index RII
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree		
Section Two: Respondents' general experience with standard bidding documents								
1	Do you think that the department or company in which you work is familiar with the non-specialized and specialized standard bidding documents issued by the Ministry of Planning?	0	2	28	47	12	3.78	0.76
2	Is the application of standard bidding documents the best solution for implementing government contracts for projects, providing stability and transparency, and reducing administrative and financial corruption?	1	0	8	39	41	4.34	0.87
3	Do you think that the ministry, governorate, or company in which you work has implemented the standard documents or is planning to implement the standard documents to implement its projects?	3	0	29	40	17	3.80	0.76
4	Are there major risks for the public or private sector when applying standard documents in terms of cost, quality, and time?	7	42	30	9	1	2.49	0.50
5	If the answer to the previous question is no, do the employees of the department or company need extensive training on standard documents?	1	1	9	43	35	4.24	0.85
6	Does the ministry, governorate, or company offer its tender transparently?	2	1	28	46	12	3.73	0.75

7	Is the time available to prepare the bids sufficiently?	11	0	30	41	7	3.49	0.70
8	Do Instructions to Bidders to Standard Documents contain all the information necessary to prepare a responsive bid?	1	0	16	65	7	3.88	0.78
9	Do the standard documents contain clear evaluation criteria and a clear application methodology?	3	0	7	68	11	3.98	0.80
10	Do the general conditions of the contract used in the standard documents cover all the commercial and legal aspects of the contract for the public or private sector?	0	0	15	58	16	4.01	0.80
11	Does the ministry, governorate, or company award the contract to the lowest-priced bidder, the qualified, and the respondent to the terms and requirements of the tender?	1	6	21	41	20	3.82	0.76
Section Three: Specialized experience with SSBD of design, supply, and installation of electromechanical works								
12	Does the ministry, governorate, or company apply the prequalification procedure when executing contracts for specialized electromechanical projects?	1	17	36	32	3	3.21	0.64
13	Does the ministry, governorate, or company have a database of solid and specialized companies that have been contracted?	1	12	31	39	6	3.42	0.68
14	Is the ministry, governorate, or company aware of the standard document for electromechanical works?	1	8	33	42	5	3.47	0.69
15	Does the ministry, governorate, or company have exceptions to the implementation of the instructions for implementing government contract No. 2 of 2014 and the subsequent controls?	3	17	40	25	4	3.11	0.62
16	Do you support the application of the standard document for electromechanical works when executing projects where the value of the plant and equipment is the largest part of the estimated contract value?	0	12	31	36	10	3.49	0.70
17	Are the instructions to bidders in the electromechanical works document to	1	2	26	53	7	3.71	0.74

	meet the requirements of the ministry, governorate, or company and clear for preparing a responsive bid?							
18	Does the ministry, governorate, or company apply the condition that bidders must submit their prices for the following components or services of the project on the basis that the full responsibility is on it (single responsibility basis)?	5	0	50	32	2	3.35	0.67
19	Do you support the evaluation of bids for electromechanical works tenders by specialized committees? Do the committees need training and development?	0	0	11	55	23	4.13	0.83
20	Are bids evaluated according to the criteria specified in the document in advance? Or are there other procedures?	4	0	35	42	8	3.61	0.72
21	Do you support the evaluation of bids according to the bid forms attached to the tender document? Does the form meet the requirements or need improvements?	1	0	34	49	5	3.65	0.73
22	Do you support preparing a user manual for the application of the sectorial standard bidding document for the design, supply, and installation of electromechanical works?	0	0	5	46	38	4.37	0.87
23	Do you support the application of calculating the net present value of the operating and maintenance costs within the cost life cycle of the project because of its significant impact on the evaluation of bids?	0	1	8	44	36	4.29	0.86

5. DISCUSSION OF RESULTS

The results in **Table 5** of section two show that the overall respondents' mean for section two was (3.77) more than the satisfied accepted mean (3) and present that the respondents are familiar with the standard bidding documents and, as a result, they agreed that the application of standard bidding documents is the best solution for implementing government contracts for projects, providing stability and transparency, and reducing administrative and financial corruption is the most important factor according to relative importance index (RII) results of 87 % because the SBDs includes clear evaluation and qualification criteria with high-quality contracts' conditions. The second important factor was the development of the capacity building of the contractual staff with 85% RII. Also, there is a negative relationship between the SBDs' application and the project management risks, as shown in **Table 6**.

Table 6. The relationship between SBDs application and risks Correlations

Is the application of standard bidding documents the best solution for implementing government contracts for projects, providing stability and transparency, and reducing administrative and financial corruption?	Pearson Correlation	1	-.276-**
	Sig. (2-tailed)		0.009
	N	89	89
Are there major risks for the public or private sector when applying standard documents in terms of cost, quality, and time?	Pearson Correlation	-.276-**	1
	Sig. (2-tailed)	0.009	
	N	89	89

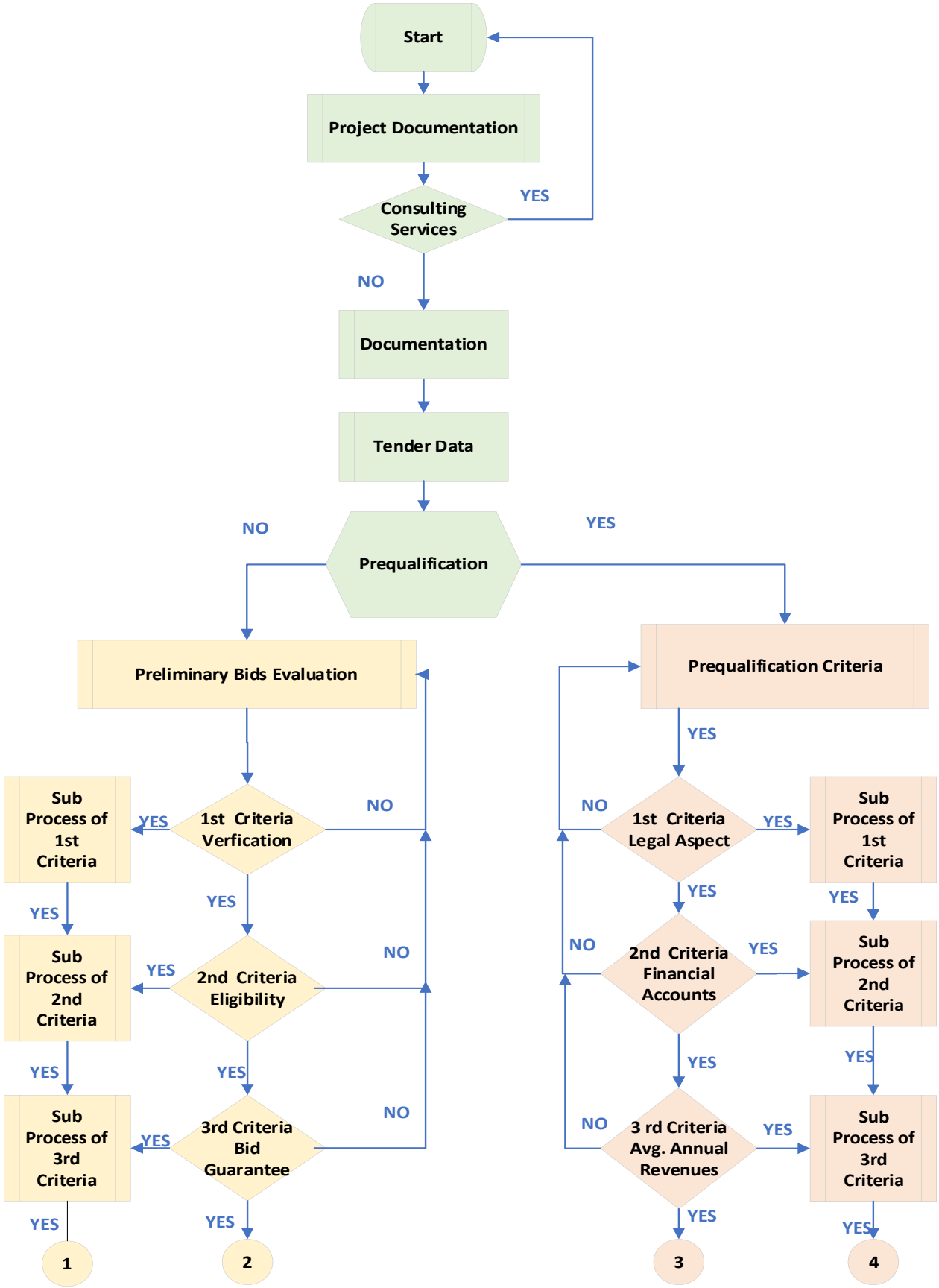
** Correlation is significant at the 0.01 level (2-tailed).

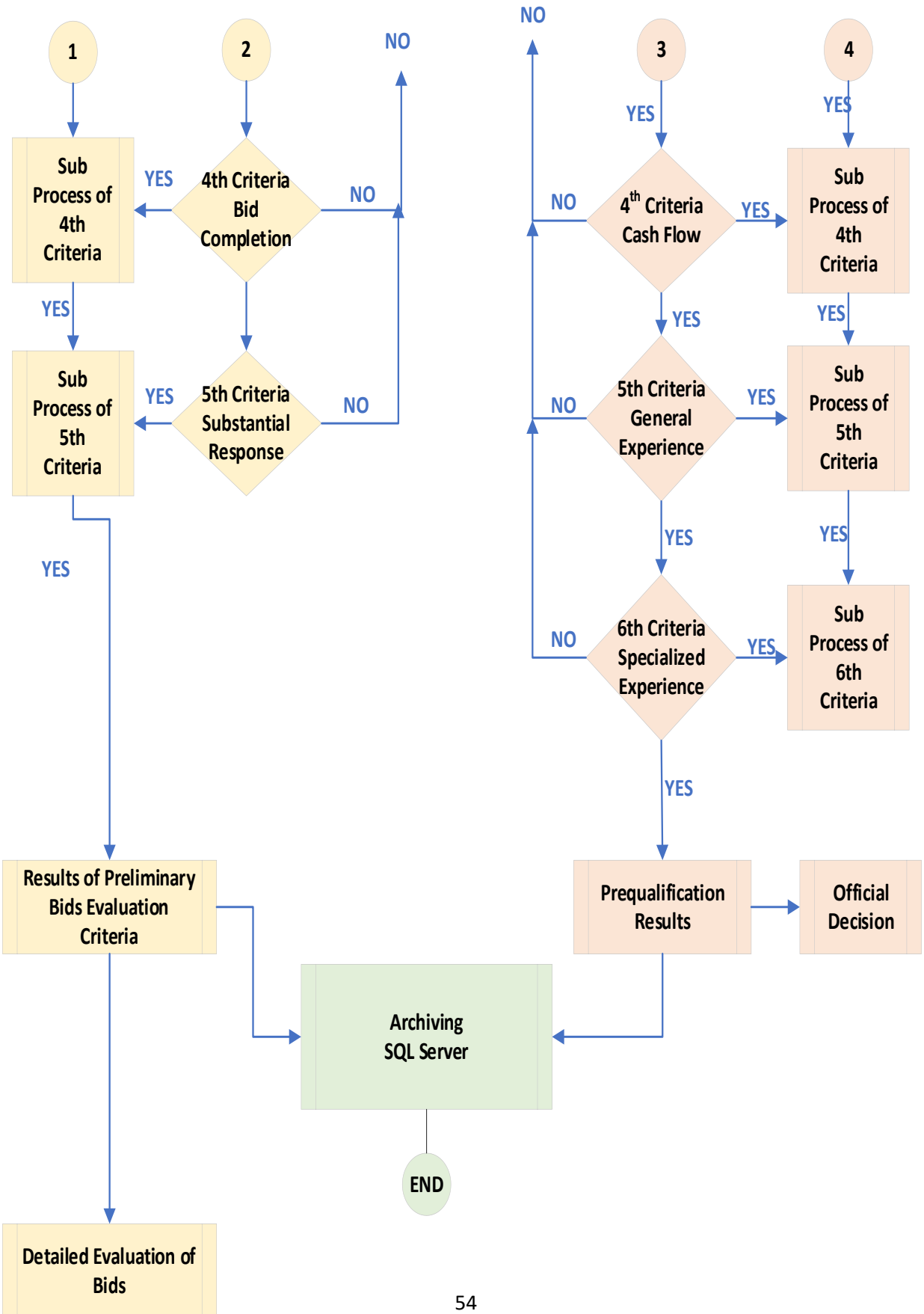
It is clear from **Table 6** that the SBDs support the project management processes, and the application of the SBDs will reduce the probability of risks.

Regarding section three, the overall respondents' mean was (3.65) and achieved the accepted satisfied mean (3) and according to the responses, the most important factor was preparing a user manual for the application of the sectorial standard bidding document of design, supply and installation of electromechanical wo preparing a user manual for the application of the sectorial standard bidding document of design, supply and installation of electromechanical works with 87 % in RII, the second important factor was the application of calculating the net present value of the operating and maintenance costs within the cost life cycle of the project because of its significant impact on the evaluation of bids with 86 % and the bids' evaluation process with 83 % as a result of projects' complexity and the respondents agreed that the SSBD for electromechanical works is designed for executing projects where the value of the plant and equipment is the largest part of the estimated contract value and they agreed that its instruction to bidders is clear to prepare responsive bid and the bids evaluated according to the criteria specified in the document in advance and there is no criteria will be added after tender closeout.

6. THE PROPOSE BIDS EVALUATION MODEL under SSBD-DSIoEW

The finding of this research guided the authors to propose a unified bid evaluation model under SSBD-DSIoEW as shown in **Fig. 4** that was then formulated into a computerized application program designed to follow the SSBD-DSIoEW preparation process and supports the bids evaluation committees in evaluating the bids of industrial projects (Power Plant).


Start
Project Documentation
Consulting Services
YES
NO
Documentation
Tender Data
NO
Prequalification
YES
Preliminary Bids Evaluation
Prequalification Criteria
Sub Process of 1st Criteria
YES
1st Criteria Verfication
NO
YES
Sub Process of 2nd Criteria
YES
2nd Criteria Eligibility
NO
YES
Sub Process of 3rd Criteria
YES
3rd Criteria Bid Guarantee
NO
YES
1
YES
2
YES
1st Criteria Legal Aspect
NO
YES
Sub Process of 1st Criteria
YES
2nd Criteria Financial Accounts
NO
YES
Sub Process of 2nd Criteria
YES
3 rd Criteria Avg. Annual Revenues
NO
YES
Sub Process of 3rd Criteria
YES
3
YES
4


1
2
3
4
Sub Process of 4th Criteria
4th Criteria Bid Completion
Sub Process of 5th Criteria
5th Criteria Substantial Response
4th Criteria Cash Flow
Sub Process of 4th Criteria
5th Criteria General Experience
Sub Process of 5th Criteria
6th Criteria Specialized Experience
Sub Process of 6th Criteria
YES
NO
Results of Preliminary Bids Evaluation Criteria
Prequalification Results
Official Decision
Archiving SQL Server
END
Detailed Evaluation of Bids

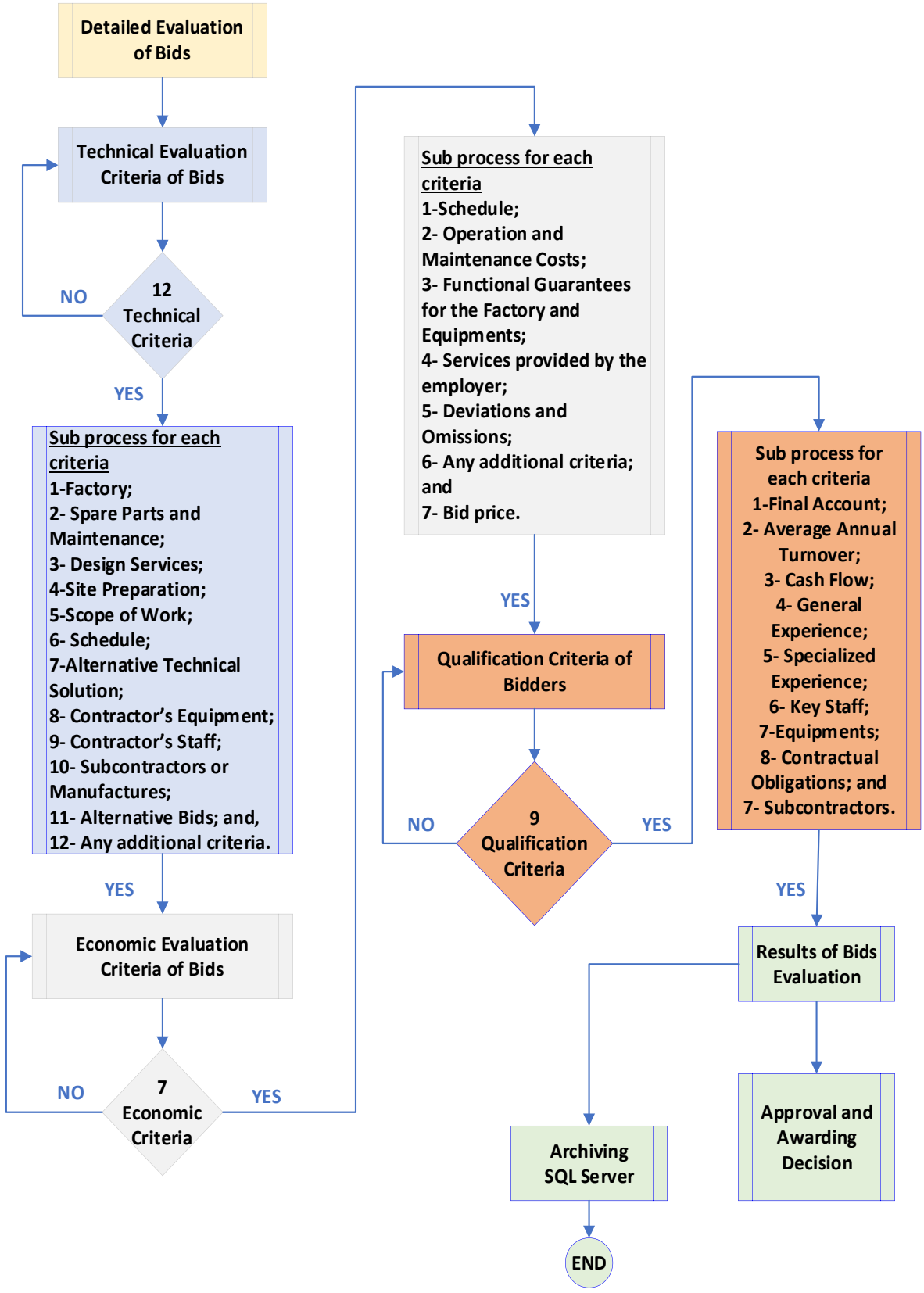


Figure 4. Flowchart for the basic components of the proposed model

7. CONCLUSIONS

Despite the significance of government contracts in the process of implementing government projects into action, there is no comprehensive law that governs these contracts and does so in a way that is appropriate for the needs of ministries, governorates, and agencies that are not part of a ministry, the regulation of implementing governmental contracts no. 2 of 2014, which was issued by MoP, does not include sufficient conditions to cover the implementation of the SBDs (Specialized and Non-Specialized) and the financial crisis, economic fluctuations, and security aspects have a significant impact on implementing governmental contracts, and it had a significant negative impact on the unwillingness of sober companies to work in Iraq's environment; While the world plans and implements mechanisms to reduce the effects of climate change and gas emissions and to maintain a sustainable environment, the study found there are no real governmental trends in urging contracting parties to apply evaluation criteria to ensure sustainable green procurement. Also, exceptions granted to contracting entities significantly negatively impact the implementation of contracts in terms of non-compliance with instructions and procedures that achieve transparency and justice, as most contracts are implemented in the manner of direct contracting or direct invitations. The SSBD-DSIoEW is a unique document and a tool for attracting sober foreign companies that will help construct a power plant per approved international standards and specifications. Also, there is a lack of contractual staff experience in the SSBD-DSIoEW application, especially with its evaluation and qualification criteria, and the capacity-building development for the contractual staff and bids evaluation committees is highly recommended; in addition, the SSBD-DSIoEW requires new controls procedures by MoP like including the climate changes criteria and issuing SSBD-DSIoEW user guide with defining the economic criteria for bids evaluation environment which supports the bids evaluation committees. The authors formulated the proposed model of bids evaluation under the SSBD-DSIoEW to a computerized application program; The program was designed by Microsoft visual studio (Visual basic. Net), with a database connected to an SQL server and structured according to the proposed model flow chart to support the bids evaluation procedures according to SBDs for the general and heavy infrastructure construction projects, especially with industrial projects.

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