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Challenging Tendering-Phase Factors in Public Construction Projects—A Delphi Study in Saudi Arabia

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Abstract: Public construction projects in Saudi Arabia are fraught with several challenges threatening open and fair competition, which consequently negatively influence the decision of contractors to participate in bidding. Nevertheless, the construction sector has witnessed rapid reforms since 2016, which have resulted in the issuing of new legislation and regulations as well as the creation of governing bodies. Hence, the concept of open and fair competition plays a significant role in the governance of these challenges in the upstream process of construction tendering. Therefore, this paper explores challenges that are hindering contractors' participation in the tendering phase of public construction projects in light of these new legislations and authorities. Twelve challenging factors were identified from a structured literature review of previous relevant empirical studies available in online search engines since the 1980s. Those factors were measured through Delphi survey questionnaires, which provided respondents with the option of adding new challenging factors. Thus, twenty factors were identified. A descriptive method was used to determine and prioritize these challenging factors. The survey findings indicate that the most influential hindering factors are (1) awarding contracts based on the lowest bidder, (2) inadequate or incomplete specifications, (3) poor contract documents, and (4) poor cost-estimating practices. These findings are vital in exposing the lack of relationships between the construction industry, regulators, and stakeholders for robust partnerships, thereby helping to ensure the fair participation of contractors, which boosts open and fair competition concepts for public construction projects.

Keywords: tendering; bidding; public construction; fair competition; Saudi Arabia

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1. Introduction

Over the past five decades and since the discovery of oil, Saudi Arabia has experienced rapid economic growth. Many national economic sectors have notably benefited from this growth. One of these is the construction and public works sector, which is considered to be a significant and reliable indicator of the trends in and health of the national economy. These efforts have resulted in considerable expenditure on construction and infrastructure projects over the past few years, which are estimated to have totaled more than USD 120 billion annually [1].

The construction industry was the largest recipient of government expenditure during the first three National Development Plans, from 1970 to 1985, exceeding 49% of the total government expenditure. Consequently, the Saudi construction industry experienced many changes, because the national economy relied heavily on oil revenues, the prices of which have fluctuated during this period. The decline in oil prices has led to a global economic recession, especially for Saudi Arabia. This downturn caused delays to many projects, particularly major infrastructure projects and development plans [2]. These recessions have also affected payment flows, financial assistance, and guarantees to contractors, and have harmed market competition, usually by reducing profits and wages.

Tendering is a significant process in the preconstruction phase, in which an appropriate contractor is selected to construct a project. This process is performed by negotiation, or eventually by competition, in order to award of contract [3,4]. Furthermore, according to Kang et al. [5], tendering is an invitation for a group of contractors where the client selects the most appropriate contractor throughout the prequalification process in which a deadline is set for contractors to submit their bid to be evaluated. Thus, contractor selection is the most challenging decision-making action that could influence a construction project [6]. Furthermore, Ayettey and Danso [7] presented the factors for ranking contractors: experience, financial standing, technical expertise, and track record. Therefore, in competitive tendering, clients award contracts to a specific contractor after passing through the process of bid evaluation [5]. Despite the many benefits associated with tendering [4,8], unethical misconduct is still influencing the tendering process [4,9].

Saudi Arabia is witnessing a huge change derived from the Saudi 2030 Vision. King Salman—Custodian of the Two Holy Mosques, King Salman Bin Abdulaziz Al-Saud—in his message in 2016 regarding the 2030 Vision declared that "My primary goal is to be an exemplary and leading nation in all aspects, and I will work with you in achieving this endeavor". Moreover, His Highness Crown Prince Mohammed Bin Salman also stated in his message that "We will be transparent and open about our failures as well as our successes, and will welcome ideas on how to improve". Therefore, vision realization programs (VRPs), initiatives, mega Projects, and transformation hubs were established [10].

Therefore, in relation to the construction sector, new entities to govern these initiatives and projects were established such as the Expenditure and Projects Efficiency Authority (Expro), the National Center of Privatization, and PPPs (NCP), and the Local Content and Government Procurement Authority (LCGPA). Moreover, the legislative framework in this sector has been updated and developed. In 2019, both the local Government Procurement and Tenders Law (GPTL) and the Competition Law were updated.

Entrance into various public tenders depends on a firm's classification levels, which are based on the resources that contractors have (the technical staff, the station, the financial sector, etc.). Based on the latest online statistical reports of the Contractors Classification Agency, issued in July 2017, more than 3500 classified local construction companies are working with the public and private sectors, while there are about 20 classified foreign companies operating in both sectors. On the other hand, there are far more nonclassified companies operating in the private sector, which are not allowed to work with the public sector.

Nawaf and Agapiou defined a competitive market as a market that is producing "a progressive technology", providing a price reduction, and higher production. Achieving fair and open competition involves providing competitive and transparent markets through the simplification of procedures, thus reducing associated administrative costs and upgrading the sector [11]. In open tendering, all interested contractors are invited to bid for tenders. Therefore, the open-tendering method enables new or unfamiliar contractors to compete for a contract [2]. As a result, fair and open competition concepts are applied; therefore, exploring the challenges that are hindering contractors from participation in public construction projects will enforce these concepts, enhancing contractors' participation.

Despite this large number of classified contractors, the bidding stage in public works contracts has witnessed a reluctance in their participation. In this regard, Alahmadi and Agapiou [11] have noted that tenders of municipal roads in Saudi Arabia have experienced a scarcity of bidders' participation, particularly lower-class contractors, despite the availability of the project value limits of most tenders. Nevertheless, the literature review indicates that limited work has covered the rational decision to participate in bidding in the context of Saudi Arabian public procurement. Thus, this paper explores challenging factors that are hindering contractors' participation in the tendering phase within public construction projects in Saudi Arabia, in light of the newly introduced legislation and authorities.

2. Materials and Methods

This research used a qualitative approach through a combination of primary and secondary sources (Figure 1). The secondary source was a comprehensive structured review, whereas the primary source was a Delphi method. Delphi has been viewed and agreed on as a qualitative method by many authors [12–14]; despite sharing some features with traditional quantitative techniques such as questionnaire surveys. Sourani and Sohail [15] stated that the conducted techniques use a questionnaire in the most of the articles, which considered the use of a Delphi method in construction-management research. The Delphi process sequentially includes the development of a round (1,2,N) questionnaire, distribution of and follow-up procedures for the round (1,2,N) questionnaire, collection of round (1,2,N) questionnaire, and analysis of the results of the round (1,2,N) questionnaire. Thus, the process continues for a predetermined number of rounds until reaching a consensus or until it becomes evident that no consensus can be reached.

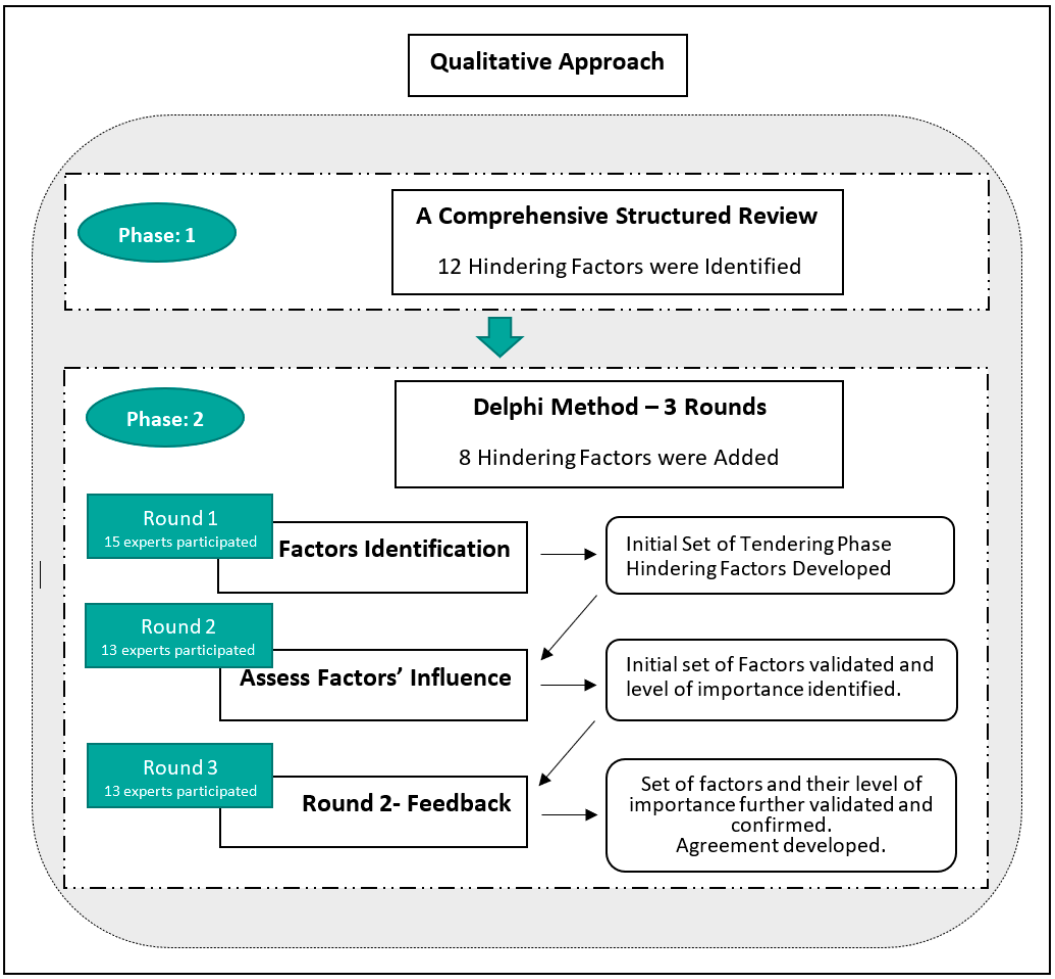

Figure 1. Research Design.2.1. Literature Review.

A structured literature review was performed to identify related published research from 1983 to 2019. The relevant papers were identified based on the top six peer-reviewed construction engineering and management journals in Chau's 1997 ranking list, which are Construction Management and Economics (CME); the Journal of Construction Engineering and Management (JCEM); Engineering, Construction and Architectural Management (ECAM); the Journal of Management in Engineering (JME); Proceedings of the Institution of Civil Engineers: Civil Engineering (PICE-CE); and the International Journal of Project Management (IJPM). "Project delivery failure" was the keyword used in the database

search engines. As a result, thirty-nine papers were identified and reviewed to determine their relevance to the research. After further refinement of these studies focusing on the papers that included the failure cause of the project delivery from contractors' point of view, only 14 were selected.

Second, separate research was conducted to identify Masters' as well as Ph.D. theses that addressed the failure of public construction-project delivery in Saudi Arabia using the Web of SUPrimo—University of Strathclyde; British Library EthOS; and the Saudi Digital Library (SDL). The keywords of "failure", "construction", and "Saudi" were all used in the subject/title/abstract field of search engines in these two databases; the initial search resulted in 13 theses. After reviewing the research topics of these theses, only 9 were identified as valid.

Delphi Questionnaire

The field of construction engineering and management (CEM) research widely applies the Delphi method [15–17]. Delphi is a method frequently used to subjectively investigate, identify, and recognize the factors that influence or may influence any particular issue, topic, or problem [12,18]. The Delphi method is simply an interactive and repetitive tool that generates anonymous controlled feedback, relies on expert experiences [19], and aims to reach a consensus [16]. Furthermore, both consensus or discrepancies between participants can be presented in Delphi by utilizing statistical summarization and comparisons [20]. However, the characteristics of experts hired as panel members as well as successive rounds applied to obtain consensus play a significant role in contributing to the validity and reliability of a Delphi study [21].

This phase aimed to identify a list of agreed key challenging factors that are hindering contractors' participation in the tendering phase of public construction projects in Saudi Arabia. This objective required collecting information from local public building experts and synthesizing them through frequent discussion to reach a consensus. Therefore, the Delphi method was applied in this phase due to its credibility for conducting an accurate investigation. Many different types of bias can influence the Delphi method (2010), therefore consideration to minimizing bias were followed [22].

The selection of experts is a critical milestone in the Delphi process. Thus, this study used three groups of qualified experts (contractors, consultants, and government officials) all of whom are familiar with the tendering phase and knowledgeable about public construction works, and were willing to share their knowledge opinions and insights. The contractors' experts were identified and listed almost entirely via the Saudi Contractors Authority (SCA), whereas consultants were selected from the Saudi Council of Engineers (SCE). The key governmental experts were identified and selected from relevant ministries and authorities based on their superior qualifications and being proactive experts in the construction industry. All the invited expert panel members had to meet the following two requirements:

1. Membership in a nationally recognized committee;
2. Passing at least 10 years of professional experience in the construction industry.

The use of controlled feedback and an iteration approach is to reach consensus among the panel members. In this approach, in the sequential round, panel members are informed of their anonymous counterparts' opinions in the previous round, where simple statistical summaries such as median, mean, or quartile ranges are presented. To identify outlying viewpoints, obtain justification, and share this information with other panelists, three Delphi rounds were conducted. The first round was to develop the initial set of factors, the second round was to validate this initial set of factors and identify the level of importance, and the third round was to develop agreement. The online questionnaires were used in all three rounds, allowing the anonymous participation of experts across various locations.

Regarding the credibility of the results, the literature suggests that the degree of consensus should be high between respondents. In empirical Delphi studies, the consensus of the Delphi participants can be determined by measuring the variance in the responses. A

lower variance leads to a higher consensus rate. Therefore, (median), (standard deviation), and (interquartile range) were adopted to measure the consensus of experts.

3. Results

3.1. Structured Review

In total, (23) studies were identified as related papers and used in this review. All literature searches were conducted during autumn 2019. According to these (23) identified studies, project failure factors are chronologically reviewed.

A review of these papers has revealed the main failure factors regarding project delivery, which may influence contractors' decision to participate in the bidding, representing the state of the art on this topic. In an attempt to cluster those critical factors that have been explored, irrelevant factors to the tendering phase were initially eliminated. These factors were consequentially synthesized, categorized, and listed under five primary areas (Figure 2): contractors' classification; bidding cost; specifications; cost estimates; and evaluation criteria.

Contractors' classification	Poor classification criteria.
	Inefficient classification system.
Contracting documents	Poor contract documents.
	Unstandardized contractual clauses.
Clarity of project specifications	Inadequate or incomplete specifications.
	Changeable project scope.
	Lack of unified building codes.
Projects cost estimating	Poor cost estimating practices.
	The absence of an independent cost engineer.
Contracts awarding	Awarding contracts based on the lowest bidder.
	Difficulty in acquiring work.
	Fluctuation of demand.

Figure 2. The most frequent impediments related to the tendering phase.

On the other hand, this chronological review revealed that most of studies which have presented impediments to the success of Saudi Arabian public projects has not specified managerial tools for mitigatinge those impediment to success. Most of these studies focused on identifying problems only; thus, the same issues in this sector were identified repeatedly over time.

3.2. Delphi Questionnaire

3.2.1. Practitioners' Demographics

This section presents the demographic information of respondents. Many studies have discussed the optimum number for a panel of experts in Delphi studies, although Ameyaw et al. [17] emphasized that the optimum number in construction studies ranged from 8 to 20.

Therefore, efforts were made to reach this number of experts in this study, 13 respondents completed all the stages of the Delphi process. To ensure that all the segments of the sector are involved, the government officials represented 30.8% of the panel, whereas contractors and consultants represented (30.8%) and (38.5%), respectively. Detailed categorizations of the participants are presented in Figure 3.

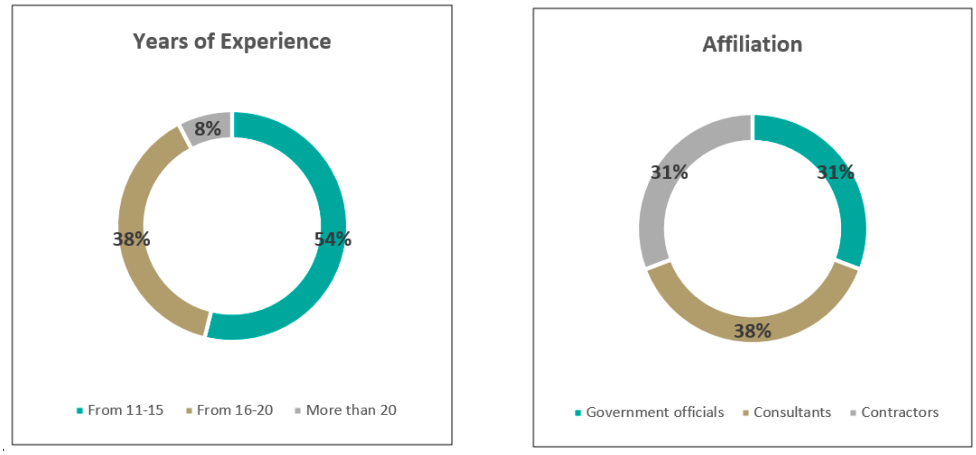

Figure 3. The experts' panel profile.

3.2.2. Round One

The first round aims to build a basis for identifying the initial set of issues decided by the selected experts in relation to the challenging bidding-phase factors of public construction contracts in Saudi Arabia. In this round, a three-section questionnaire was sent via e-mail to the 25 experts. The first section of the questionnaire concerned the demographic information of participants. Then, the experts were asked to evaluate their agreement with factors revealed in the structured literature review, according to their knowledge and experiences. Furthermore, the questionnaire asked the participants to list any further issues not mentioned in the previous literature. A total of 15 out of 25 experts (60.0%) contributed their expertise and knowledge, yielding a list of 20 challenging factors, which were consequentially synthesized, categorized, and are listed in Table 1 and Figure 4.

Table 1. Summary of the panel evaluation of the initial challenging factors in Round 1.

Group	Factors	Round 1		
		$\tilde{x}$	Std.	IQR
Contractors' classification	Poor classification criteria	4	0.93	1.50
	Inefficient classification system	4	1.03	1.00
Contracting documents	Poor contract documents	5	0.64	1.00
	Unstandardized contractual clauses	5	0.64	1.00
Clarity of project specifications	Inadequate or incomplete specifications	5	1.15	1.00
	Changeable project scope	4	0.63	1.00
	Lack of unified building codes	4	0.92	1.00
Project cost estimating	Poor cost-estimating practices	4	0.80	1.50
	The absence of an independent cost engineer	4	0.85	2.00
Contract awarding	Awarding contracts based on the lowest bidder	5	0.72	0.00
	Difficulty in acquiring work	3	1.22	2.00
	Fluctuation of demand	3	1.16	1.50

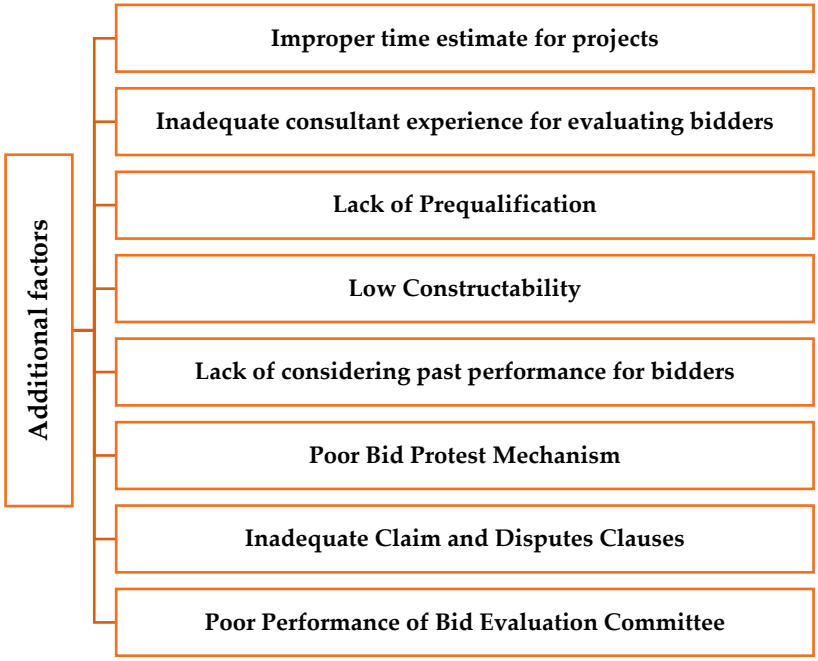

Figure 4. Additional challenging factors.

3.2.3. Round Two

All experts who responded to round one received a second questionnaire that included a list of all 20 factors obtained from the first round. Through this questionnaire, experts were asked to assess the impact of these factors on contractors' involvement in public construction contract bidding. A ten-point Likert scale was applied in this round, with 1 being "not at all important" and 10 being "extremely important". A total of 13 experts participated in this round, yielding a 52.0% response rate.

3.2.4. Round Three

Based on the identified set of critical factors in the decision to engage in public construction biddings during the previous two rounds, and the average assessment of their importance, a final round of questionnaires was conducted. In this questionnaire, the respondents were asked to provide their importance assessments of the identified factors after reviewing the average ratings of round two participants, as well as to submit comments explaining or justifying their ratings. This round received feedback from 13 experts, yielding a 52.0% response rate.

3.2.5. Interpretation of the Results

Table 2 details all statistical tests of experts' evaluations for hindering factors in both the second and third rounds. It can be seen that standard deviations and interquartile ranges of the importance ratings in the third round are lower than their counterparts in the second round. This highlights that the experts' consensus on the importance of these factors has improved, and that the study has consequently reached a greater consensus among experts.

Table 2. Summary of the panel evaluation of influencing degree of the challenging factors in both round two and round three.

Group	Factors	Round 2			Round 3		
		$\tilde{x}$	Std.	IQR	$\tilde{x}$	Std.	IQR
Contractors' classification	Poor classification criteria	8	2.25	2.00	8	2.15	1.00
	Inefficient classification system	8	1.76	2.00	8	1.66	1.00
Contracting documents	Poor contract documents	9	1.85	2.00	9	1.81	1.00
	Unstandardized contractual clauses	8	1.68	2.00	8	1.49	1.00
Clarity of project specifications	Inadequate or incomplete specifications	9	1.39	1.00	9	1.39	1.00
	Changeable project scope	8	1.38	2.00	8	1.34	1.00
	Lack of unified building codes	7	1.52	2.00	7	1.50	1.00
Project cost estimating	Poor cost-estimating practices	9	1.66	1.00	9	1.66	1.00
	The absence of an independent cost engineer	8	2.57	2.00	8	2.42	2.00
Contract awarding	Awarding contracts based on the lowest bidder	10	0.77	1.00	10	0.65	1.00
	Difficulty in acquiring work	7	1.89	2.00	7	1.85	1.00
	Fluctuation of demand	8	1.70	1.00	8	1.64	1.00
Added Factors	Improper time estimate for projects	9	1.89	1.00	9	1.83	1.00
	Inadequate consultant experience for evaluating bidders	8	1.11	2.00	8	1.44	1.00
	Lack of prequalification	8	1.63	2.00	8	0.91	1.00
	Low constructability	8	2.03	2.00	8	1.26	1.00
	Lack of considering past performance for bidders	8	1.41	2.00	9	2.02	1.00
	Poor bid-protest mechanism	8	2.10	2.00	8	2.01	1.00
	Inadequate claim and disputes clauses	9	1.44	2.00	9	1.44	2.00
	Poor performance of bid-evaluation committee	9	2.06	1.00	8	1.98	1.00

It also shows that there is an overwhelming consensus on the importance of "awarding contracts based on the lowest bidder" on the decision of potential bidders to participate in public construction tendering. In summary, the most influential hindering factors are (1) awarding contracts based on the lowest bidder, (2) inadequate or incomplete specifications, (3) poor contract documents, and (4) poor cost-estimating practices. A comprehensive discussion of all factors is presented in the Discussion.

4. Discussion

4.1. Current Challenging Factors

The current challenging factors are partially mentioned in the literature review regarding the tender phase. There is a lack of research regarding tendering-phase challenges in Saudi Arabia, but these factors were gathered from different research topics such as project delivery, CSFs in construction, and project management.

4.1.1. Contractors' Classification

Both "poor classification criteria" and "inefficient classification system" obtained average consensus rate of 0.715 and 0.746, respectively, to be consensually considered challenging factors in the public construction tendering phase in Saudi Arabia. These two attributes appear to be rooted in the local public construction sector, because this agreement concurs with Al-Barrak's [23] and Almutairi's [24] assertions that the mechanisms of the contemporary contractors' classification system in Saudi Arabia are somewhat ambiguous and unclear. Furthermore, it is consistent with Alsugair and AbuThnain [25] regarding the inefficiency of contractors' classification criteria in Saudi Arabia. One of the expected consequences of this vagueness and inefficiencies of the prequalification process is discouraging contractors [24], which in turn leads to the unwillingness of most of them to participate in future bids. In summary, the provision of objective contractors' classification criteria and then publishing those criteria as suggested by the OECD report [26], encompassing their

weighting scores, eliminates uncertainty in bidding requirements, thus critically enhancing more participation in future tenders.

4.1.2. Contracting Documents

The panel agreement was slightly higher when ranking poor contract documents (0.854) and unstandardized contractual clauses (0.769) as the main attributes of the local public-construction-works contracting documents. This consensus is consistent with the assertions of both Al-Sinan [27] and Al Saudi [28], that the ambiguity of contractual terms or tender documents, in general, is considered an obstacle to the project success of any public-construction-works. The differences in contract terms and conditions lead to some ambiguity, which in turn might cause a contractor to pay unjust fines, thus seriously increasing the contract risk for contractors. Agaba and Shipman [29] pointed out that standardized bidding documents play a vital role in public procurement reforms. Therefore, standardized bidding documents will eliminate uncertainty in contractual terms, thus enhancing their desire to bid in the future.

4.1.3. Clarity of Project Specifications

The panel highly emphasized the weakness in the current clarity of the specifications of local construction projects. They evaluated inadequate or incomplete specifications (0.862), changeable project scope (0.815), and lacks of unified building codes (0.762). These opinions corresponds with the assertions of many previous studies in the same local context, such as Assaf et al. [30], Albogamy et al. [31], and Elawi et al. [32]. Jannadi [33], Al-Khalil and Al-Ghafly [34], and Asif [35], as well as Al Saudi [28], confirmed that work specifications in public construction contracts in Saudi Arabia suffer from the lack of an inaccurate scope of work. Additionally, and most importantly to the scope of this study, Bageis and Fortune [36] found that the clarity of specifications is one of the most important factors influencing contractors to decide to bid. Ensuring accuracy and details in bidding documents, particularly specifications, lead contractors to a greater understanding of these specifications, which is reflected in the increase in the number of those desiring to bid by raising the level of their certainty to do so.

4.1.4. Project Cost Estimation

It was demonstrated from the panel assessment that project cost-estimating practices in Saudi Arabia still suffer from inaccuracy. Both "poor cost-estimating practices" and "the absence of an independent cost engineer" obtained average consensus rates of 0.846 and 0.723, respectively. These two attributes also appear to be rooted in the sector, as Al-Barrak [23] and Ikediashi et al. [37] reported, poor estimating practices as one of the main project-failure factors in Saudi Arabia, and Al Saudi [18] emphasized the necessity of having an independent engineer to bridge the gap to the adoption of the design and construction procurement approach. Ishii [38] asserts that the accuracy, consistency, and reliability of engineer cost estimates are critical in facilitating cash-flow management. Moreover, Kerzner [39] affirmed that cost-estimation accuracy is promoted by providing highly efficient data. Nevertheless, Oberlender and Trost [40] argued that the accuracy of cost estimates relies on several factors, such as clarity of the project scope.

4.1.5. Contracts Awarding

Although the panel prominently agreed to recognize awarding public construction contracts based on the lowest bidder as a main challenging factor in the bidding phase (0.962), they showed less agreement on both other attributes in this group, "difficulty in acquiring work" and the "fluctuation of demand". This consensus is implicitly in line with the assertions made by Al Ghafly [41], Al-Khalil and Al-Ghafly [34], Al Saudi [28], Albogamy et al. [31], and Alhammadi et al. [42], that the concentricity of bid-evaluation criteria in Saudi Arabian public procurement on the bids' values disregards other qualifications. Alofi et al. [43] asserted that public procurement authorities in Saudi Arabia should

introduce an objective evaluation-criteria system. This assertion is in line with an OECD report [44] encouraging public procurement authorities to define and objectively weigh all of their bids' evaluation criteria in advance.

4.2. Additional Challenging Factors

Practitioners throughout the first round of the Delphi questionnaire separately mentioned additional challenging factors in the tender phase. These additional factors were not mentioned in the literature review regarding the tender phase of public construction projects in Saudi Arabia. These additions were due to the option of freely expressing opinions at the end of the questionnaire. Then, practitioners in the second round confirmed the additional challenging factors—in the Saudi context—through consensus and ranking.

4.2.1. Improper Time Estimates for Projects

Assaf and Al-Hejji [45] stated that a project is rarely completed within the specified time. Ogunsemi and Jagboro [46] highlighted that attempts to predict construction duration is always a problem of concern and interest to both researchers and project managers. Meanwhile, Kazemi et al. [47] proposed a new method for solving CPM problems through Liu's definition of random fuzzy variables through the expected duration optimization model and the mean-variance model. Furthermore, Naderpour et al. [48] found that the proposed model increases the accuracy of time estimations by about 8–24%. In addition, Naderpour et al. [48] proposed a precise model to provide comprehensive project-time estimations by which risk-management and fuzzy-expert systems were integrated in order to manage both modes of time uncertainty in construction projects.

4.2.2. Inadequate Consultant Experience for Evaluating Bidders

Awarding a project to a suitable contractor is a difficult process [49,50]. Nazari et al. [51] found that among the main criteria, the 'experience and past performance' of consultants was confirmed to the most important criterion in the prequalification process. Wang et al. [52] concluded that in the ability group, owners were more concerned about consultants' firm qualifications and knowledge, whereas consultants were more concerned about owners' qualifications. Due to a lack of equality in information, owners compensate with the professional knowledge of consultants. Thus, the consultants and clients are interdependent. Previous findings have suggested that prior experience has a vital influence on trust but ignore the fact that partners may lack cooperative experience in construction projects (Wang et al. [52]).

4.2.3. Lack of Prequalifications

Contractor prequalification is a widely followed process for selecting responsible and competent contractors to perform construction contracts and provide the desired results with minimal damage [53,54]. Thus, contractor's prequalifications should be considered a multicriteria decision issue because potential contractors are measured and judged according to a set of common criteria [53]. Therefore, Acheamfour et al. [55] confirmed that there is a general consensus among researchers that contractor prequalification is a very significant phase of the construction procurement process. Moreover, in project management, Lam et al. [56] stated that contractor prequalifications are very important for both clients and contractors. Similarly, El-Sawalhi et al. [57] indicated that the prequalification of construction contractors is a very important step in the project procurement cycle.

4.2.4. Low Constructability

The concept of constructability intends to integrate engineering, construction, and operation knowledge and experience in order to better achieve project objectives [58]. Constructability studies reveal that designers have always sought to reduce the existing gap between designers and builders [59]. Usually, at the construction stage, construction stakeholders have problems with designers due to a lack of plan applicability or conflicting

and nonexecutive plans [60]. Moreover, constructability implementation has a direct influence on project cost and time and progress to achieve the ideal conditions; therefore, considering planning constructability implementation in the early stages of the project lifecycle is essential [59,61]. Additionally, several studies have endeavored to address the constructability subject and harmonize its controversial aspects [62]. Consequently, many techniques and methods have been developed to improve design constructability, including developing guidelines, checklists, expert systems, and empirical formulas [62–64].

4.2.5. Lack of Considering Past Performance for Bidders

Unanimously, participants confirmed the "lack of considering past performance for bidders" was the most important hindering factor. Padhi and Mohapatra [65] suggested that the contractor-selection process does not attach any importance to the past work performance of contractors. Forcada et al. [66] categorized the past performance of bidders as a classification factors which should be used in the prequalification process. In addition, selecting the right bidder for the right project has been shown by many studies to be a key challenge for any construction client [67–69]. Moreover, different methods of weighting–rating–calculating (WRC) are used for evaluating a bidder based on past performance [70,71].

4.2.6. Poor Bid-Protest Mechanisms

Gordon [72] stated that complaints which arise after awarding contracts are not protests; however, complaints arising during the tendering process are identified as a protests. A protest is always between the government and a vendor that wants the project, but does not receive the contract (a "disappointed bidder," as it is often called). Tavengahama et al. [73] argued that the majority of these small and medium establishments (SMEs) do not have operational works councils, in which bid-protest-handling mechanisms are also dysfunctional due to the lack of disciplinary committees or authorities. This argument then means that in almost all cases the designated agent (DA) ends up taking the role of the works council, disciplinary authority, and grievance-handling authority.

4.2.7. Inadequate Claim and Disputes Clauses

Joshi and Pimplikar [74] stated that construction projects are mostly performed with the governance of contracting between client and contractor, whereas large-scale projects involve various other stakeholders during the entire life cycle of the construction project. Consequently, claims and disputes arise due to the nature of complex construction projects. Thus, when there is a lack of conflict management in some or all stakeholders, these conflicts can turn out to be claims, and eventually become disputes, in cases where they remain unattended or unresolved. Jagannathan et al. [75] observed in their literature review that although the people and behavioral (PB) factors have a dominant impact on the litigative behavior of parties, a poorly drafted contract can promote such behavior in people that may result in litigation. Moreover, Joshi and Pimplikar [74] globally reviewed a set of research articles addressing the existing systems of litigation and alternate dispute-resolution mechanisms. In addition, the Five-Step Mechanism for dispute resolution is based on the principle of "prevention is better than cure." Joshi and Pimplikar [74] reported that this is a unique approach that was discussed with respect to its applications in the construction sector by Steen [76].

4.2.8. Poor Performance of Bid-Evaluation Committee

Zhang [77] stated that during the NPC and CPPCC in 2017, some representatives recommended that the "the evaluated lowest bid price method" should be eliminated. In addition, Dadpour et al. [78] concluded that shortlisting consultants for long-term and fragmented data collection in project prequalification should be avoided. Moreover, Xiao et al. [79] stated that the bid-evaluation committee should recommend a sophisticated expert as committee director in order to govern the bid-evaluation procedure and assess

the expertise of the bid-evaluation committee. Regarding to the bid-evaluation committee and the method of bidding evaluation, Zhang [77] proposed that "if the lowest bid price method is adopted, the bid evaluation committee shall make necessary price adjustments according to the method of price adjustment stipulated in the bidding documents, with the bid quotations of all bidders and the commercial part of the bidding documents."

5. Conclusions

The tendering phase in the construction industry is complex and faces many challenges within Saudi Arabia. This paper explores challenging factors that hinder contractors from participating in the tender phase of public construction projects. Related research regarding project delivery, critical success factors, and project management have generally covered challenges in the construction industry within the Saudi context, but with limited attention to challenging factors in the tendering phase. The benefit of exploring these challenging factors boosts the understanding of difficulties in the early stages of construction processes. Despite efforts for transformation through new legislation and authorities in the whole construction-tendering processes, the perception of these hindering factors in the early stage would enhance law enforcement and facilitate contractors' participation, thus supports fair and open competition.

However, in order to enhance fair and open competition in public construction projects, many contractors need to participate in tendering. In this study, a total of 20 challenging factors were identified through a combination of a literature review and a Delphi questionnaires survey. Based on a survey of contractors, consultants, and governmental official experts in the construction industry, five categorized factors were revealed using a clustering approach, including 'contractors' classification', 'contracting documents', 'clarity of project specifications', 'project cost estimation' and 'contract awarding'. Furthermore, the survey findings indicate that the most influential hindering factors are (1) awarding contracts based on the lowest bidder, (2) inadequate or incomplete specifications, (3) poor contract documents, and (4) poor cost-estimating practices. These findings are vital in exposing the lack of relationships between construction industry, regulators, and stakeholders for robust partnership, thereby helping to ensure the fair participating of contractors, thus boosting open and fair competition concepts for public construction projects.

There are limitations to this study. This study used a small sample size; therefore, the results should be treated with some caution and followed up by a quantitative study. However, this offered the greatest opportunity for analyzing all qualitative data because an increased sample size would have led to saturation of data, and it is not uncommon for Delphi studies to use this type of sample size. Therefore, in future research, the authors intend to construct a quantitative survey for measuring these challenging factors in tendering-phase processes using a generalized questionnaire surveys. The questionnaire will represent the other part of an exploratory mixed method for supporting the generalizing and validity of these challenging factors in the construction industry.

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