Investigating the Vertical Integration State and Requirements In Iraqi Construction Sector

Dr. Ahmed Mohammed Raoof Mahjoob

Farah Amer

Engineering College/Baghdad University

Abstract

The vertical collaboration is a partnering relation formulated among two specialist firms work in the same business with different specialties. This study examines the motives to involve in such relations, the criterion that must be considered while selecting a partner and the critical success factors for vertical collaboration during contracting and implementation. A questionnaire survey was designed to evaluate 23 motives for vertical partnering, selection criteria included (the financial capabilities, administrative capabilities, executive capabilities and the reputation of firm), the total number of criterion is 30 each one is related to a one of to a main criteria and the critical success factors was based on the pillars of partnering (trust commitment, communication, mutual targets, flexibility, sharing losses and profits and disputes resolution). It was found that the construction firms adopt vertical partnering to increase the coordination among professionals, the most effective criterion that lead a firm to select a specific partner is the availability of financial liquidity and bank accounts, the most critical factor for vertical partnering is to evaluate the possible critical points before any project initiation .

Key words: vertical collaboration, vertical partnering, motives, selection criteria, critical success factors

1. Introduction

The collaboration is a fundamental factor for successful project implementation and it can be obtained by sharing knowledge and information on a basis of contractual connection [28]. Collaboration among firms vary according to the **dimension**. There are two dimensions of collaboration: horizontal and vertical the differences among these dimensions are clarified in the table 1. In order to understand the notion of collaboration, the attention must be paid to the nature of adopted contracting system. Such type of contracts are called relational contracts (RC). RC is a collaborative working arrangement used during the formulation of partnering, alliancing, joint venturing, and long term commitment, joint risk sharing mechanisms, integrated project delivery [2] , it is based on recognizing the mutual benefits and win-win scenarios using more collaborative relationships among

participants [27]. RC is a branch of the modern contract law adapted by [12], who referred to the importance of contact flexibility, dynamic nature of project conditions that require dynamic review of the liquidated damages, employ reasoning that is based on social matters, and adopt negotiation in defining obligations due to the dynamic changes in the general environment of projects.

Table 1 the differences between Vertical and Horizontal collaboration

Vertical collaboration	Horizontal collaboration
(1) Vertically collaborated firms that establish relation internally with suppliers and providers [4].	(1) Horizontally collaborated firms may tend to cooperate with other non-competitor firms in the case of entering in a competition [4].
(2) In construction industry the parties in horizontal collaboration are related to the same core business such as contractor-contractor collaboration, designer-designer collaboration. There is a possibility that the participants in a horizontal collaboration were previously competitors because they belong to the same business and this may occur if they are from the same geographic area	(2) In the vertical collaboration parties are from various parts of the supply chain. For example, a specialist contractor could be one of the suppliers of a local main contractor. The design firms' collaboration with construction firms is also classified as vertical relation. In other words there is probably no competition between them, as they are not from the same specialty [35].

The other approach of understanding the whole collaboration concept emphasized on the means to provide the cooperation through partnering by employing the collaborative methods developed in alliance and joint venture for further effective partnering relations [9], [10], [8], [33] without avoiding the strategic nature of alliance and joint ventures that are based on long term commitment. These studies adopt (critical success factors CSFs) as a measurement of partnering performances, and these factors are (adequate resources, management support, creativity, mutual objectives, commitment, equity, trust, attitude, openness, team building, effective communication, problem resolution, time responsiveness, effective coordination, long term commitment, continuous improvement). Some partnering researches assessed the benefits and incentives for partnering due to the difficulties faced by firms to combine the necessary resources to undertake with specific requirements.

According to that, a new market is opened for small and medium construction firms that may work together to be qualified for working in major projects by partnering [6]. Selecting a suitable partner is very difficult in the newly emerged economies that are referred to as dynamic and complex environment, so choosing the right partner may maximize the reliability, create appropriate environment for configuring strategy and minimize the uncertainty [23].

2 Methodology

2.1 Research design

This research consists of three parts. Each part examines a different level of partnering. The first level is based on the motives that lead firms to adopt vertical partnering instead of traditional contract with specialist subcontractors, suppliers. The second level comprised of the factors that used to evaluate the possible partner and check if he complies with the requirements. While the third level based on the evaluation of the success factors of vertical partnering and the means to provide healthy partnering process.

2.1.1 The motives for vertical partnering

The main purpose to study motives is to create a clear conceptualization about the importance of the motives from specialists' view, so the firms can assess their need for partnering. There are 23 motives for vertical partnering these motives are adapted from the literature [6], [19], [22], [32].

2.1.2 Partner selection criteria

The main purpose to study the selection criteria is to have clear indications that must be considered during partner selection process. The criteria examine the ability to provide collaborative relationship with a specific partner taking into account different aspects for the financial, executive, administrative capabilities and firm's reputation. Thirty factors was specified to evaluate the possible partner, each factor is related to specified main criteria, these criteria are based on [5], [13], [19], [27], [30].

2.1.3 Partnering critical success factors

These factors conceptualize the abilities and methods that provide trust, commitment, communication, mutual targets, flexibility, sharing losses and profits, and disputes resolution through contract and implementation was specified to maintain effective collaborative partnering process. The sub-criteria are classified into the specified seven main criteria, on the basis of previous literatures literature [1], [3], [7], [8], [9], [10], [11], [14], [27], [15], [16], [17], [18], [20], [21], [24], [25], [26], [29], [31], [33], [34].

2.2 Questionnaire survey

In order to study the three represented levels, a questionnaire survey was undertaken for evaluating the vertical partnering motives, criteria, and partnering CSFs in 15th February in Baghdad The respondent was asked about the importance of the motives, selection criterion and critical success factors of vertical partnering keeping in mind the lack to the familiarity of the vertical relations definition in the construction sector. The evaluation of the importance was based on five points Likert scale as it is shown in Table 2.

Table 2 five points Likert scale

1	2	3	4	5
Not important	Low importance	Medium importance	High importance	Very high importance

2.3 The characteristics of the sample

The total number of respondents is 46 who have experience exceeds 5 years. The sample includes consultants, contractors, designers and lawyers that are related (construction firms or sections) and they belong to the private or public sector as shown in the in Table 2.

Table3 the characteristics of sample

The characteristics	Type	percentage
The sectors	1- Public sector	83%
	2- Private sector	17%
Academic education	Ph.D.	11%
	MSc.	24%
	BSc.	65%
Specialties	civil engineer	57%
	Architect	17%
	electrical engineer	4%
	mechanical engineer	13%
	Statutory	9%
Experiences	from 5 to 10	37%
	from 10 to 15	26%
	from 15 to 20	11%
	from 20 t0 25	4%

	more than 25	22%

3 Results

The findings of the questionnaire were statically evaluated by calculating the mean value of the importance degrees that was specified by the respondents. The results of the motives' importance, selection criteria, and critical success factors are shown in the tables 3, 4,and 5 respectively each table includes the symbol of the factor, mean value, ranking, standard of deviation (STD) and ranking according to the main criteria (sub- ranking)

Table 4 the motives for vertical collaboration

Motives	Symbol	Mean	STD.	Rank
1- Reduce the traditional contention between (main contractor –subcontractor)	A1	3.890	0.76	10
2- Aiming to please the owner	A2	3.983	1.01	8
3- Increase the coordination among the participants	A3	4.341	0.74	1
4- Better control on the implementation schedule	A4	4.312	0.75	2
5- Decreased exposure to the risks of failure and delay	A5	4.009	0.77	7
6 -Better quality of the provided services and materials due to the partnering that is reflected on the whole project	A6	4.124	0.79	5
7- Noticeable increase in the rate of return	A7	3.600	0.73	22
8- Reduced rate of the mistakes that may require repeating the rectifying processes	A8	4.220	0.77	3
9- Costs' sharing and the pressure of the execution costs will be decreased	A9	3.692	0.75	15
10-The competitiveness ability is increased (increased capital)	A10	3.929	0.87	9
11- Developing competitiveness capabilities in the market to a long term	A11	3.678	0.88	17
12- Facilitating the entrance to a new business and implementing projects of different nature	A12	3.654	1.14	19
13-The excessive need for qualified and experienced staff	A13	4.175	1.01	4
14- For improving the reputation of firm	A14	4.083	0.95	6
15- Enhancing the innovation potentials through different stages of the project	A15	3.832	1.1	12

16- For fitting the legal requirements on the level of local region or province	A16	3.592	0.86	23

Table 4 continued

Motives	Symbol	Mean	STD.	Rank
17-The keen for continuous improvement in project details	A17	3.671	1.08	18
18- Sharing the effects of risks	A18	3.690	1.13	16
19- Minimized design cycle	A19	3.642	0.97	20
20- increase the cultural responsiveness among different cultures	A20	3.605	1.06	21
21- increase the ability to gain knowledge from other participating firms	A21	3.715	0.97	14
22- The aim to enter the global market	A22	3.879	1.02	11
23- Reducing the administrative expenses	A23	3.749	1.02	13

Table 5 the selection criteria for vertical collaboration partner

Main criteria	Factors	Symbol	Mean	STD	Total rank	Sub rank
Financial capabilities	The available financial liquidity and bank account	B1	4.508	0.89	1	1
	The availability of the necessary equipment and vehicle	B2	4.224	0.96	7	2
	The activity of cost management system	B3	3.882	0.91	22	5
	The ability to handle the fluctuation of materials' cost	B4	3.818	0.89	25	6
	The ability to provide guarantee in the case of needing loans	B5	3.938	1.0	19	4
	The size of firm	B6	4.085	1.05	14	3
Administrative capabilities	The nature of the adopted contracting system	B7	3.901	0.83	21	7
	Previous experience in similar projects	B8	4.445	0.84	2	1
	The ability to make decision in critical situation	B9	4.293	0.97	5	2
	The organizational structure of the firm	B10	4.089	0.78	13	4
	The availability of training system	B11	4.052	0.98	15	5
	The nature of relation with	B12	3.711	0.90	27	9

	subcontractors					
	The familiarity with local legal authority	B13	3.931	0.94	20	6

Table 5 continued

Main criteria	Factors	Symbol	Mean	STD	Total rank	Sub rank
	Adopting the continuous improvement methodology	B14	3.811	1.08	26	8
	The used methods for securing the safety of workers	B15	4.197	0.80	8	3
Executive capabilities	The quality of provided materials and services	B16	4.420	0.75	3	1
	The skills and potentials of employees	B17	4.258	1.03	6	2
	The ability to use innovative methods for planning, implantation and data representation.	B18	4.045	0.84	17	7
	Partner's ability to deliver the materials or executing the required work on time	B19	4.173	0.79	10	4
	The acceptance of solving problems jointly	B20	4.120	0.89	12	6
	Having teamwork spirit	B21	4.189	0.88	9	3
	The similarity of goals	B22	3.844	0.89	23	9
	The negotiating possibility for defining the common commitments, earnings ratios and	B23	4.130	0.79	11	5
	Acceptability of exchanging information continuously	B24	3.979	0.88	18	8
Reputation of firm	Compliment from trusted dependable people	B25	4.047	0.87	16	3
	The success of previous partnerships	B26	4.085	0.88	14	2
	Reputation that is related to the claims and	B27	4.047	1.02	16	3
	Trust resulting from the familiarity with the partner and working with him previously	B28	4.383	0.80	4	1
	The current work load	B29	3.700	0.86	28	5

	The experience in the local geographic nature	B30	3.826	1.03	24	4

Table 6 the critical success factors for vertical collaboration partner

Main criteria	Factors	Symbol	Mean	STD	Total rank	Sub rank
Trust	1- Creating change management system	C1	3.815	32	0.87	6
	2- Formulating a reasonable pricing system	C2	3.765	33	0.85	7
	3- Official confirmation of all the verbal instruction	C3	4.030	21	0.88	3
	4- Monitoring and evaluation of work periodically	C4	4.013	23	0.95	4
	5- Building a joint team and behaving as a one team	C5	4.216	12	0.87	2
	6- Adopting no blame culture	C6	3.654	36	0.99	9
	7- Signing the partnering deal before participating in the project	C7	4.266	8	0.84	1
	8- The length of partnering term and the possibility of future collaboration are considered as a trust index	C8	3.697	35	0.83	8
	9- The support of higher management level	C9	3.900	29	0.91	5
Commitment	1- Clear and understandable identification of the mutual obligations	C10	4.163	13	0.76	2
	2- Commitment in performing the services within the their specific time	C11	4.086	20	0.72	4
	3-Commitment in the required quality standards	C12	4.320	3	0.64	1
	4- Commitment in providing services and materials with in their specified cost	C13	4.092	19	0.81	3
	5- Commitment in providing the services using specific techniques that defined in the contract	C14	4.027	22	0.89	5

	6- Commitment in the continuous amendment	C15	3.930	27	0.84	6
	7- Commitment in establishing the partnership culture in organizational structure of partnered firms	C16	3.702	34	0.96	8

Table 6 continued

Main criteria	Factors	Symbol	Mean	STD	Total rank	Sub rank
	8-Commitment in joint planning to provide coordination among the partners to achieve the required synchronization and specification	C17	3.880	30	0.83	7
Communication	1- Sending monthly or daily reports when it is required	C18	4.277	6	0.79	4
	2- Creating groups from the participating firms for monitoring the work	C19	3.860	31	0.10	7
	3- Undertaking periodic meetings to make the important decisions	C20	4.150	16	0.97	5
	4- Providing specific connection methods such as emails and mobiles	C21	4.308	4	0.82	2
	5- Confirming the accuracy of the exchanged information	C22	4.322	2	0.82	1
	6- Limiting the communication among different administrative levels	C23	3.978	24	0.87	6
	7- Working on coordination among the participants for determining the appropriate time of supplying the required materials or services	C24	4.288	5	0.67	3
Mutual Targets	1- Defining the final features of the project	C25	4.150	16	0.74	3
	2- Determining the profits' margins	C26	3.954	26	0.80	5
	3- Joint problems' solving	C27	4.270	7	0.78	1
	4- Developing an employee training program for making the appropriate action for solving problems	C28	4.157	15	0.80	2
	5-Distributing the responsibility and power on the participated firms and	C29	4.139	17	0.87	4

	giving them the rights of monitoring the project development					
Flexibility	1- The ability of modifying the paragraphs in the contract on the basis of the partners' consents or the desire of the owner	C30	4.106	18	0.66	1

Table 6 continued

Main criteria	Factors	Symbol	Mean	STD	Total rank	Sub rank
	2- Accepting the change in the prices of materials and services	C31	3.904	28	0.89	3
	3- Adoption of the negotiations due to the potential differences in circumstances before and after the contract stage	C32	4.086	20	0.90	2
Sharing losses and profits	1- Sharing profits and bonuses in specific percentage determined in the contract	C33	4.162	14	0.90	2
	2- Sharing fees of delays and poor implementation	C34	3.880	30	1.17	4
	3- considering availability of flexibility in sharing of benefits and losses process	C35	3.958	25	0.10	3
	4- Sharing the responsibility collectively when the error is occurred	C36	4.257	9	0.86	1
Disputes resolution	1- Determining the critical points in the projects	C37	4.333	1	0.71	1
	2- Creating risk management plans that include (identifying, analyzing the risks and responding and monitoring methods)	C38	4.224	11	0.80	3
	3- Emergency plans are made and employing responsible and qualified personnel to take the right steps when the situation require	C39	4.240	10	0.83	2
	4- determining the accepted reasons for delay and quality affecting factors in contract	C40	4.150	16	0.90	4

4 Discussion

1-The major motive to adopt vertical partnering is to increase the coordination among the participants in the construction project as a result the usual controversial relations among the project participants that may lead to the lack of compatibility. Better control on the implementation schedule is rated in the second place due to the difficulties that face the contractor to control the schedule and finish the project on time. The third important motive is to reduce rate of the mistakes that may require repeating the rectifying processes, because partnering would help to distribute the obligations on parties instead performing all the services by single firm. This will increase the control on performance that minimize the mistakes that require corrective actions. The fourth important motive is the excessive need for qualified and experienced staff trained to perform a specific services that forces the firm to develop a partnering agreement. The fifth important motive is the better quality of the provided services and materials that resulted from partnering, which is reflected on the whole project because of the participation of highly specialized firms in the implementation process. It is illustrated in the **Fig.1**.

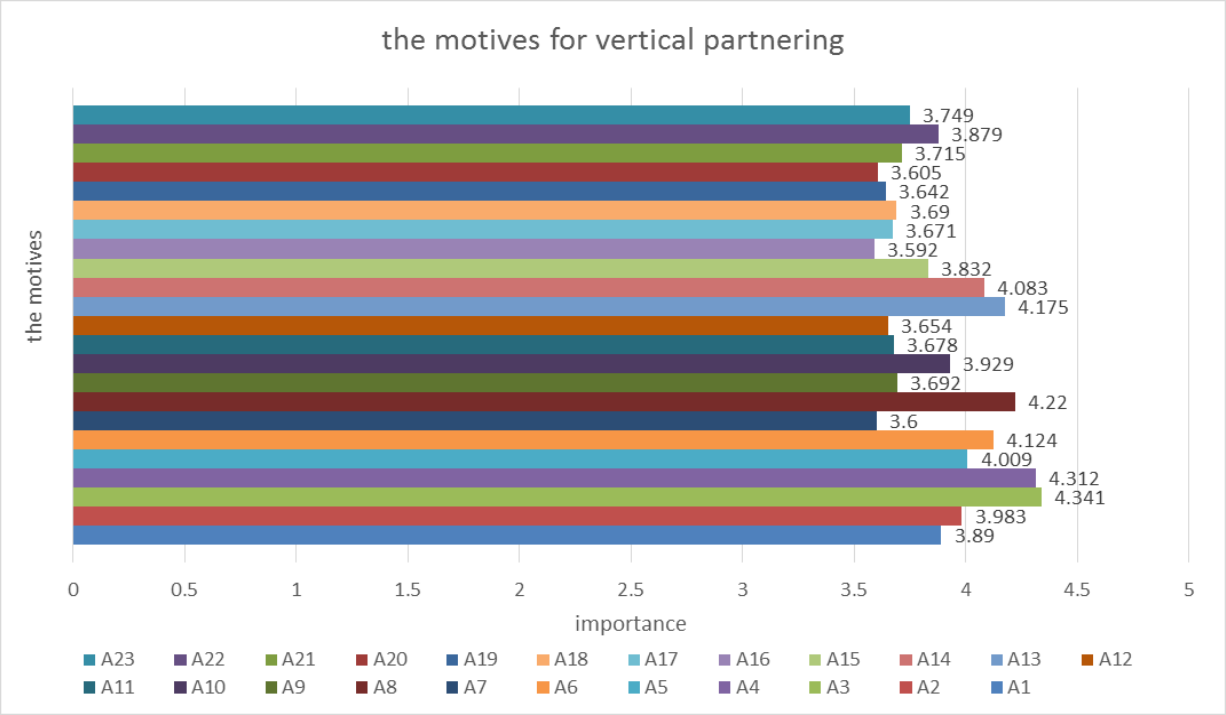

Fig. 1 the motives for vertical integration

2- The effective criterion in selecting a partner is the availability financial liquidity and bank accounts that increases the capital that enhances the opportunity of the contractor to win the bid because he will be more financially assuring. Previous experience in similar projects is the second most important factor that form indications to evaluate the possible partner. These indications are related to the success of the work by providing the required services and collaborate effectively with the parties. The quality of provided materials and services is the third important factor, this will improve the reputation of firm in the market by being more recognizable on the level of performance standards. Trust resulting from the familiarity with the partner and working with him previously is the fourth important factor, this will promote to formulate an assessment of the attitude of the possible to figure if he will be highly collaborative. This is shown in the **Fig.2**

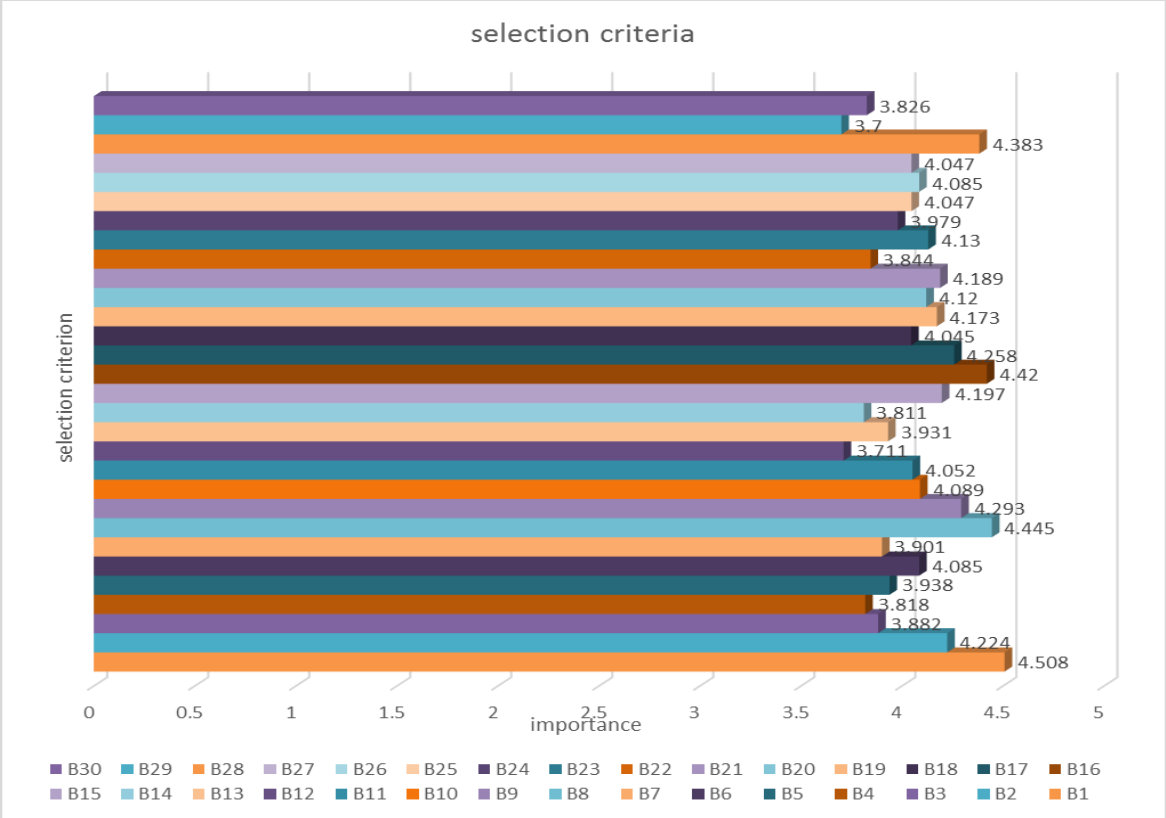

Fig. 2 the selection criteria for vertical integration

3- The most critical success factor in vertical partnering projects is defining the critical points in the project which helps to distribute the responsibilities on participants during the critical stages in order to reduce the blame

among the partnered firms. The second critical factor is confirming the accuracy of exchanged information as a result of effective and continuous communication that increases the trust among the partnered firms by keeping all the parties informed. The third critical factor is the commitment in the required quality standards by creating a clear quality plan to measure the services' and materials' quality. The fourth critical factor is providing specific connection methods such as emails and mobiles, which is an official communication among the partners to secure continuous and activated harmonization. The fifth critical factor is working on coordination among the participants for determining the appropriate time of supplying the required materials or services that reduces the waste of time and money due to potential mistakes arise from incompatibility among parties this is further clarified in the **Fig.3**

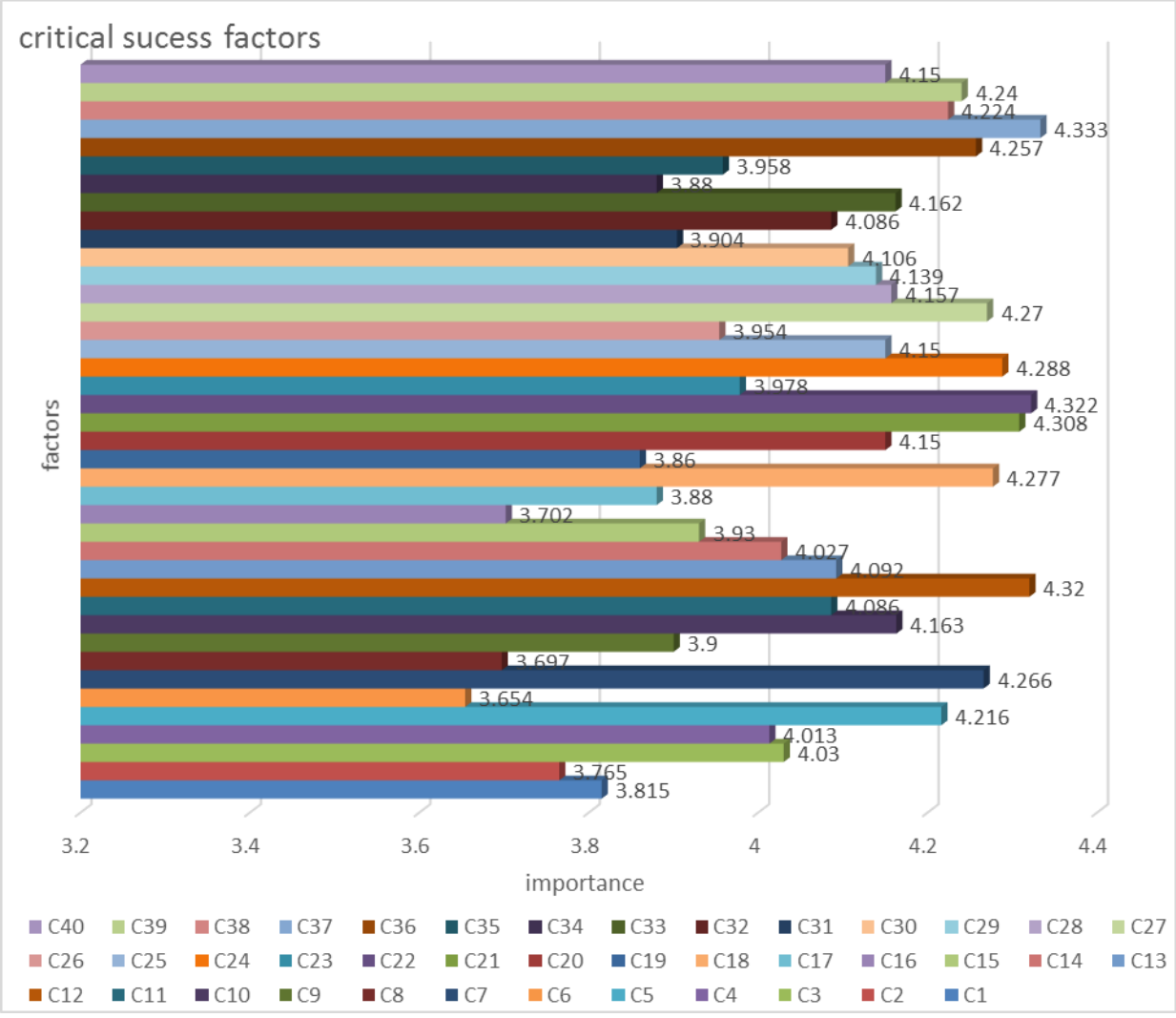

Fig. 3 vertical integration critical success factors

4-The average importance of executive capabilities of the possible partner is the highest, financial is rated as the second important, 5-Considering the average importance of the critical factors' main criteria the disputes resolution is the most important in comparison with other main criteria as it is shown in the **Fig.5**

administrative is the third important criteria, and the firm's reputation is the lowest important s it is shown in the **Fig. 4**

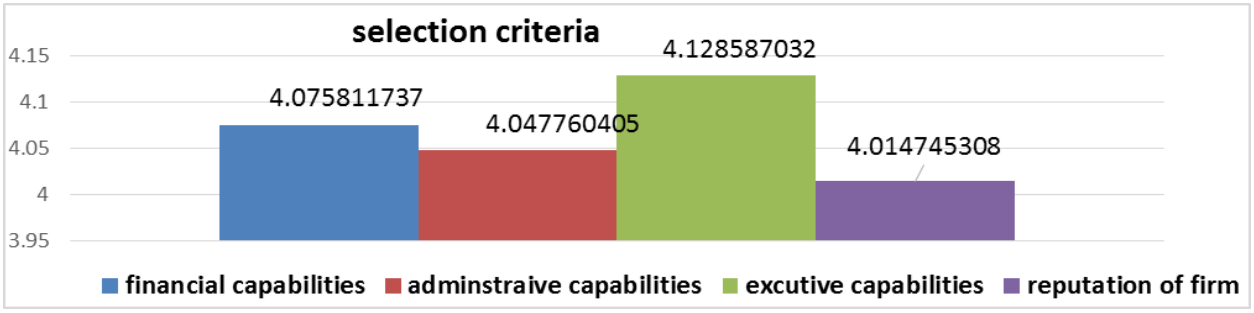

Fig 4 selection criteria (main criteria average importance)

Fig.5 critical success factors (main criteria average importance)

5 Conclusion

-The survey was tested to check the normality of data and goodness of fit.
-The results of the normality test indicated that all the motives, selection criteria and the critical success factors are not normally distributed.

-The goodness of fit test showed that there is a high variance among the degrees of importance in the motives, selection criteria and the critical success factors.

-The data is highly skewed (negative skewness), which means that the curve is not symmetric. The negative skewness means that the data are closer to their maximum values than their mean. In other word, the majority of the respondents rated the importance of all the motives, selection criteria, and critical success factors higher than medium importance

-The major motives to adopt vertical partnering are the need to increase the coordination among the participants, better control on the implementation schedule, reduce rate of the mistakes, the excessive need for qualified and experienced staff trained to perform a specific services. While the effective criterions in selecting a partner are the availability financial liquidity and bank accounts, previous experience in similar projects, the quality of provided materials and services and trust resulting from the familiarity with the partner. The most critical success factors in vertical partnering projects is defining the critical points in the project, confirming the accuracy of exchanged information, the commitment in the required quality standards and providing specific connection methods such as emails and mobiles.

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التحقق من متطلبات التكامل العمودي في القطاع الانشائي العراقي

المدرس الدكتور احمد محمد رؤوف محجوب
فرح عامر كامل

الخلاصة

التعاون العامودي هو علاقة شراكة تنشا بين مؤسستين متخصصتين تعملان في نفس مجال العمل و لكن باختصاصين مختلفين. يدرس هذا البحث الدوافع للاشتراك و المعايير التي تؤخذ بنظر الاعتبار عند اختيار الشريك و عوامل النجاح الحرجة للتعاون العامودي خلال مراحل التعاقد و التنفيذ. صُممت استمارة استبيان لتقييم 23 دافع للشراكة العامودية ،معايير اختيار تضمن (الامكانيات المالية و الامكانيات الادارية و و الامكانيات التنفيذية و سمعة الشركة)و بلغ عدد المعايير30 ،نسب كل معيار الى احد المعايير الرئيسية ، اما عوامل النجاح الحرجة المبنية على دعامات الشراكة (الثقة، الالتزام، التواصل، الأهداف المشتركة ،المرونة ،مشاركة الخسائر و الفوائد وحل النزاعات). وتبين أن شركات التشييد تتبنى شراكة عامودية لزيادة التنسيق بين المهنيين، وأن المعيار الأكثر فعالية الذي يقود الشركة إلى اختيار شريك معين هو توافر السيولة المالية والحسابات المصرفية، وأهم عامل للشراكات العامودية هو تقييم النقاط الحرجة المحتملة من قبل البدء باي بالمشروع.

الكلمات المفتاحية : التعاونات العامودية ، الشراكات العامودية ،دوافع، معايير اختيار ،عوامل نجاح حرجة