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Investigating the Relationships between The Partners' Selection Criteria In Inter Organizational Strategic Cooperation In The It Industry of Iran

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ABSTRACT

Objective: Today, inter-organizational cooperation such as strategic partnerships and joint ventures are among the most important business management tools to improve the competitiveness of organizations, especially in complex and chaotic environments. Methodology: This study aimed to determine the relationships between partners' selection criteria in inter-organizational strategic cooperation in the IT industry of Iran. The study sample is IT managers and experts of Tehran. Research made questionnaire was used for data collection and using the Delphi technique and fuzzy DEMATEL, data were analyzed; the research findings show that partners having criterion of complementary resources, partners having criterion of specific advantages in the activity field and tangible assets having criterion such as intangible assets are the main criteria. Results: The technology and innovation ability having criterion in the joint venture field, having the good market share in the industry, having the work experience in the field of partners activity, having the special technical capabilities and a willingness to share their expertise are the core criterion. Similarity criterion of cooperation companies in terms of big and having criterion of distribution channels is also the independent criteria. Conclusion: The research results showed that having special technical capabilities that help partners, have a particular importance for organizations that tend to have inter-organizational cooperation. Therefore, it is recommended that organizations that lack these important factors or are in low level strengthen their technical capabilities to be able to have interorganizational cooperation with influential organizations.

1. Introduction

Today, in the era of globalization and knowledge-based economy, organizations should be survived in the socio-economic environment that is as increasingly and competitive and unstable. The development of IT and communication has had an important role in the inter-organizational cooperation. Alliance has effect on business performance, so different organizations operate with each other as different cooperation models. Alliance as a mechanism is for leverage the competencies. So increases survive in the turbulent market conditions. It can be created a cooperation network between different organizations. Concerns such as identifying the ways to control costs, improve the quality for organizations that are face with pressure and staying in the competitive environment, increase of efficiency and risk management are important. Designed assessment tools help to organizations in this field. Inter-organizational partnership is considered as one of the most powerful factors of creating value and among the most important business tool. Today, the ability in their effective management is considered as a competitive advantage. Partnerships can be occurred in different stages of the value chain and in each of the sectors of research, product development, production, marketing, distribution and after-sale services. The form of partnerships is placed in the spectral between two ranges of "buy" and "integration-property".

Peter Drucker states that: "The biggest change in the way of business is increase of communication growth based on partnership, not on the basis of property today inter-organizational cooperation is as one of the most important business management tool to improve the competitiveness of organizations particularly in the complex and turbulent environment and the capability of effective management is considered a competitive advantage.

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Driving of companies to enter in to strategic alliances is the achievement to a high level of success that the possibility to achieve this level of success alone is not possible (Araz and Ozkarahan, 2007).

In the past decade more numbers of IT companies are towards the strategic alliances, but a considerable number of alliances have failed (3) (4). One of the most important reasons for the failure of alliances is the lack of harmony and compatibility between the partners.

1.1 BACKGROUND LITERATURE aluminum

Everyone has a certain understanding of cooperation and is often confused with collaboration. When some words are mentioned such as networking, communication and coordination, the confusion will be more. Although each of these concepts is an important component of cooperation but their values aren't the same. There are different definitions for cooperation. According to the survey, the most comprehensive definition was defined by Kamarinha and Afsarmanesh in 2006 as follows:

"The cooptation is a process that shares the entities, information, resources, responsibility of accountability for the planning, implementation and evaluation of a program of activities to get the common purpose.

1.1.1 Inter-organizational cooperation

Inter-organizational cooperation (IOC) is defined as the relationship between the organizations that is a leverage between the various participants in order to balance the concerns and achieving to common goals of stakeholders. IOC increasingly is common between the public and private institutions because they have potential to effective address of the complex issues that require a comprehensive approach and more investors such as government agencies and institutions are in need of organizational cooperation .IOC also attractive because it seems like away to improve services or maintain the manufacturing costs through sharing the resources and improving the performance (Arino, 2003).

1.1.2 Strategic alliance

A strategic alliance is a cooperation agreement between two or more organizations that by this way want to improve their competitive position and their performance through shared resources.

Elsewhere, strategic alliances have been defined such this: the participation of two companies or two or more business units to achieve the main strategic goals that partners mutually benefit from the partnership (Feyzio glu and Nebol, 2008).

1.1.3 Fuzzy DEMATEL technique

DEMATEL technique that was presented by American scientists for the first time during1926 to1972 was a method for the complex problems. This technique was made based on graph theory that was able to resolve the issues with the simple approach, but a wrong is on DEMATEL technique, ie decision-making under uncertainty condition was led to present of fuzzy technique. This technique applies in the production, organization management, information systems and social sciences fields (9). In addition, this technique can solve all problems facing organizations using group decision-making in the

DEMATEL technique is an abbreviation for Decision Making Trial and Evaluation. DEMATEL technique was presented in 1971byFontelaandQabus. DEMATEL technique that is the variety of methods to decide on the basis of paired comparisons, with the benefit of expert judgment in the factor extraction of a system and systematic structure to them by application of the principles of graphs theory, present the hierarchical structure of the available factors in the system along with links of mutual interaction, so that the impact of these relationships is specified as a numerical score. DEMATEL method is used to identify and investigate the relationship between the criteria and the mapping of the network. As directed graphs can show relationships of a system elements better, so DEMATEL technique is based on graphs which can divide the involve factors into two groups of cause and effect and made the relationship between them as a understandable structural model. DEMATEL technique generally is created to investigate the very complex global issues. DEMATEL also used to structure a sequence of given information. As that investigates the intensity of communication as scoring, it surveillances the feedbacks coupled with the importance of them and accepts the inalienable relations.

1.1.4 Core factors

Factor or factors that influence on the most of other factors and its events can cause project failure and must be resolved.

1.1.5 The main factors

Factor or factors that affect on the most of other factors and its events can threaten the success of the project and should be removed.

1.1.6 Independent factors

Factor or factors that isn't influenced on the other factors and its events does not pose a serious threat to the success of the project

2. Materials and methods

2.1 METHODOLOGY

The present study is applied objectively and is descriptive survey methodologically.

The study sample is executives of operating companies in the IT industry. The numbers of 20 experts were chosen from the considered sample as the

expert group.

In this research, data collection has been as field method and questionnaire instrument is used and for data analysis, fuzzy DEMATEL is used.

2.2 RESEARCH QUESTIONS

The main question

- 1. What is the relationship between the partners' selection criteria in inter-organizational strategic cooperation in IT industry? Sub questions
- 1. Which one of the partners' selection criteria in inter-organizational strategic cooperation is a core criterion?
- 2. Which one of the partners' selection criteria in inter-organizational strategic cooperation is a main criterion?
- 3. Which one of the partners' selection criteria in inter-organizational strategic cooperation is an independent criterion?

2.3 ANALYSIS OF FINDINGS

In this study, the technique of DEMATEL is used for assessing and measuring the relationships between the partners' selection criteria in interorganizational strategic cooperation in IT industry. A research made questionnaire is used for data collection and the questionnaire was distributed among the professionals from the IT industry and the data were collected. The used criteria in the questionnaire were identified and determined in 18 factors that were evaluated and analyzed in the form of DEMATEL technique (Dacin & Levitas, 1997).

2.3.1 First step: extract of factors list

In the first step, 25 affecting criteria on the partners selection in inter-organizational strategic cooperation were collected based on the review of literature and studied researches, and were given to experts of IT industry to using experts view, the considered criteria modified and finalized. The final list is as follows.

List of the main criteria:

- 1. Partners having from the resources that complete the defects and short comings of other resources of partners.
- 2. Having the compatibility and perfect fit in terms of structure and organizational culture and lack of cultural conflict between partners
- 3. Having a good management philosophy and principal, in terms of practice and management style
- 4. Having the ability of technology and innovation in the field of Joint venture
- 5. The similarity of partners companies in terms of magnitude
- 6. Having the financial clarity and not having the tax issues and financial difficulties
- 7. Partners having from the particular advantages in the context of its activities
- 8. Having the fit in the huge goals and strategies of the Company and no conflicts of them
- 9. Having the honor and reputation of partners in industry
- 10. Having the sufficient experience in the field of partners' activity
- 11. Having the suitable program for learning and knowledge acquisition
- 12. Having the good market share in the industry
- 13. Having the skills and necessary knowledge in company executives
- 14. Having the distribution channels such as different dealers, sales offices in target markets
- 15. Having the tangible assets (eg financial resources), intangible assets
- 16. Having the necessary knowledge about the target market and industry market.
- 17. Having the special technical skills that are helpful to partners.
- 18. Having the willingness to share its expertise with partners

2.3.2 Second step: preparing a questionnaire and determine the most important parameters based on fuzzy Delphi method

The research made questionnaire that is prepared based on the factors and specified criteria in the previous step, was given to experts and industry experts and responses of individuals were collected. In this step 18 effective criteria on the risk of power projects using the opinion if fifteen experts and review of literature were collected, using the principle of Pareto was ranked and among them, 10 factors of which had a higher degree of importance, were identified. Table I. shows these factors.

The method is that after extracting the experts' responses to questionnaire by calculating the average score of weighted average for each factor, the score of each factor is determined (Table I). Using the Pareto principle the first ten factors will be ranked which allocated about 80 percent of the weighted value to itself.

Table 1

rank	Option	score	Criteria				
C1	1	8.534	Partners	ha	ving	the	
	1	8.334	compleme	ntary	resource	S	
C2	4	8.385	Having	the	ability	of	

			technology and innovation in the field of Joint venture
СЗ	5	8.350	Similarities of partner companies in terms of magnitude
C4	6	7.860	Partners having the particular advantages in the context of its activities
C5	10	7.582	Having sufficient experience in the field of partners activity
C6	12	7.400	Having a good market share in the industry
C7	14	7.320	Having the distribution channels such as dealers and sales offices in target markets
C8	15	6.950	Having the tangible assets such as intangible assets
С9	17	6.890	Having special technical skills
C10	18	6.850	Having the willingness to share their expertise

2.3.3 Third step: eight steps of DEMATEI

Preparing the questionnaires based on DEMATEI method

To investigate the effect of results factors from the early ratings on each other and their final ranking that lead to reducing the human error we use DEMATEL method. To investigate the impact of factors on each other, in this step using the questionnaire (which is a paired comparison matrix) in Delphi method and technology experts (for the initial weighting of DEMATEL) the impact of factors against each other will be assessed.

2.4 Data analysis with DEMATEL method

2.4.1 First step: Designing the criteria of fuzzy language

In this step, we need to determine the criteria for decision making. To solve the lack of confidence should give the criteria to decision-maker according to linguistic criteria (Table 1-2) with respect to these criteria, the criteria to be compared with each other.

Table 2. language scale for paired comparisons

Language words for paired comparisons	Time values
very high impact	(1, 0.75, 0.75)
High impact	(1, 0.75, 0.5)
Low impact	(0.75, 0.5, 0.25)
very low impact	(0.5, 0.25, 0)

2.4.2 Second step: survey of respondents

M

In this step, opinion of 20 experts is assessed and collected using the final questionnaire. In other words, about 18 criteria affecting on the partners' selection in inter-organizational cooperation, have been collected from the surveyed experts and their opinions.

2.4.3 Third step: making the initial decision matrix (O ~)

When used in multiplayer point of view, the simple average of opinions is used and form M. Using the experts opinion the relationships govern on the relationship between vertices of paired comparisons among the factors that determine $n \times n$ and the matrix represent the effect of the relationship between them, form according to every expert opinion (where aij is the degree of criterion influence of ci to cj). Given that in this study, the opinions of 20 professionals and experts are used, the relevant matrix is as follows.

											c10	
	cl	0	0.66	0.35	0.66	0.33	0.23	0.33	0.25	0.66	0.66	4.13
	c2	0.33	0	0.25	0.25	0.33	0.5	0.25	0.33	0.66	0.33 0.25	3.23
	c3	0.66	0.33	0	0.33	0.25	0.25	0.75	0.66	0.75	0.25	4.23
	c4	0.67	0.75	0.5	0	0.33	0.25	0.25	0.33	0.25	0.25 0.75 0.66	3.58
	c5	0.66	0.25	0.25	0.25	0	0.25	0.25	0.25	0.25	0.75	3.16
1-	c6	0.33	0.25	0.33	0.25	0.66	0	0.75	0.25	0.33	0.66	3.81

2.4.4 Fourth step: normalized matrix (N~)

In this step, the obtained direct relationship matrix from the previous step will be normalized. To do this, multiply M matrix in reverse of the most total of row from matrix M. The calculation formula is as follows:

$$N = K * M$$

Where k is calculated as follows. The sum of all rows is calculated. Reverse of the largest number constitute k row.

$$k = \frac{1}{\max \sum_{j=1}^n a_{ij}}$$

$$k = 1/4.31 = 0.0560$$

2.4.5 Fifth step: matrix calculation of complete connection

In this step normalized matrix of pervious step using the following equation change to matrix of complete connection.

$$T = N \times (1-N)-1$$

Total of unlimited sequence from the direct and indirect effects of elements on each other (with all the possible feedback) calculate as a geometric progression, based on the existing rules of graphs. The calculation of this set also will need to use (inverse). Indirect effects of the existing elements convergence to the inverse matrix, because the indirect effects throughout the chains from the existing diagraphs will be continuously decreasing.

2.4.6 Sixth step: Calculate the threshold

For the removal of the less criteria, we calculated the impact of threshold. Using the formula of the threshold:

$$Ts = \frac{\sum_{i=1}^{n} \sum_{j=1}^{m} V_{ij}}{m \times 2} =$$

$$TS = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} V_{ij}}{m \times n} = \frac{\sum_{i=1}^{n} D_{i}}{m \times n} = \frac{\sum_{j=1}^{m} R_{j}}{m \times n}$$

$$\left\{ egin{array}{ll} U_{ij}=V_{ij} & V_{ij}\geq Ts \ U_{ij}=0 & U_{ij} = 0 \end{array}
ight.$$
در غيراين صورت

So according to the formula:

$$T_s = (6.4533) / (10x10) = 0.064533$$

2.4.7 Seventh step: Calculate of Di + Ri and Di-Ri

After this step, the calculation of (R and D) will be done, where D is total of row and R is total of column and according to the gravity center method, came out of the fuzzy mode then (D+R) and (D-R) were calculated that the results of calculation is in table (4-3).

Table 3. Calculation of (R and D)						
	D	R	D+R	D-R		
C1	1.19316	1.2349	2.42806	-0.04174		
C2	0.98436	1.1908	2.17516	0.20644		
C3	1.21636	0.8753	2.09166	0.14106		
C4	1.06556	1.1004	1.16596	-0.03484		
C5	0.96812	1.2558	2.22392	-0.08768		
C6	1.11892	1.0424	2.16132	0.07652		
C7	1.1398	1.0261	1.5659	0.1137		
C8	1.23492	1.0052	2.24012	0.12972		
C9	1.1746	1.214	2.3886	-0.0394		
C10	1.02612	1.1769	2.02302	0.15078		

2.4.8 Eighth step: Creating chart A

The last stage is the drawing chart of direct and indirect effect with respect to (D+R) and (D-R). In this diagram, the relationships between the partners' selection criteria in inter-organizational cooperation are specified. In this study, using figure drawn and input and output flash data of each criterion and by considering the assumptions of DEMATEL, finally, the degree of impact and effectiveness as well as the severity of the impact and effectiveness of criteria was expressed in the following form.

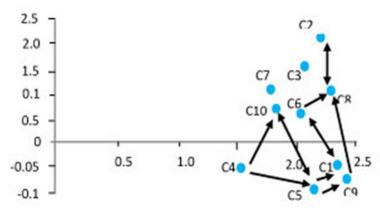


Table 4

3. Discussion and results

The results of this research to seek, answers to the following research questions that the questions are as follow and their answers are presented below:

- 1. Which one of the partners' selection criteria in inter-organizational strategic cooperation is a core criterion?
- 2. Which one of the partners' selection criteria in inter-organizational strategic cooperation is a main criterion?
- 3. Which one of the partners' selection criteria in inter-organizational strategic cooperation is an independent criterion?

4. Conclusion

In this study, using figure drawn and input and output flash data of each criterion and by considering the assumptions of DEMATEL, finally, the degree of impact and effectiveness as well as the severity of the impact and effectiveness of criteria was expressed in the following form.

- 1) Criterion C1, is a criterion that influenced from two criteria of C5 and C6 and affects on C6. According to assumption of DEMATEL techniques such as (D + R) = 2.42806 and
- (D-R) = -0.04174 therefore, it is said, criteria C1 is one of the most important factors in relation of partners in the inter-organizational cooperation and should be given more attention. This concept is consistent with the result of Rounti Mavridoglou (2005) and Araz and Ozkarahan (2007).
- 2) Criterion C2 is a criterion that only influenced from C8 criterion and just affected on this criterion. According to assumption of DEMATEL techniques

such as (D + R) = 2.17516 and (D-R) = 0.20644 therefore, it is said, criteria C2 is the core criterion in relation of partners in the inter-organizational cooperation and should be given more attention. The research result of Christsen (2008) and Rounti Mavridoglou (2005) are consistent with the result of present study about having the ability of technology and innovation in the field of Joint venture.

- 3) Criterion C3 is a criterion that not influenced on any criterion and not affected from any criterion. According to assumption of DEMATEL techniques such as (D + R) = 2.09166 and (D-R) = 0.14106 therefore, it is said, criteria C3 is the independent criterion in relation of partners in the interorganizational cooperation. This factor in the research of Sluyts et al (2011) was identified as an independent criterion and is consistent with the result of present study.
- 4) Criterion C4 is a criterion that influenced on two criteria of C10 and C5 and not affected from any criterion. According to assumption of DEMATEL techniques such as (D + R) = 1.16596 and (D-R) = -0.03484 therefore, it is said, criteria C4 is the main criterion that affects on a number of important factors in relation of partners in the inter-organizational cooperation. This criterion can be one of the main problems in the relations of inter-organizational and should be given more attention to it. The result of Sluyts et al (2011) and Sorensen (1999) and Mueller and Herstatt (2000) are consistent with the research results of this study about the fourth factor.
- 5) Criterion C5 is a criterion that influenced on criteria of C10 and C9 and C1 and affected from C4 and C10. According to assumption of DEMATEL techniques such as (D + R) = 2.22392 and (D-R) = 0.08768 therefore, it is said, criteria C5 is the core criterion in relation of partners in the interorganizational cooperation.
- 6) Criterion C6 is a criterion that influenced on two criteria of C1 and C8 and just affected from criterion C1. According to assumption of DEMATEL techniques such as (D + R) = 2.16132 and (D-R) = 0.07652 therefore, it is said, criteria C6 is the core criterion in relation of partners in the interorganizational cooperation. This concept is consistent with the research result of Jamali and Hashemi (2011), Sluyts et al (2011) and Araz and Ozkarahan (2007).
- 7) Criterion C7 is a criterion that not influenced on any criterion and not affected from any criterion. According to assumption of DEMATEL techniques such as (D + R) = 1.5659 and (D-R) = 0.1137 therefore, it is said, criteria C7 is the independent criterion that isn't influenced on any factors in relation of partners in the inter-organizational cooperation. The research result of Hanvanich et al (2003) and Rounti Mavridoglou (2005) and Nielsen (2003) confirmed the result of present study about the seventh factor and are consistent with the result of present study.
- 8) Criterion C8 is a criterion that not influenced on any criterion but affected on three criterion. According to assumption of DEMATEL techniques such as (D + R) = 2.24012 and (D-R) = 0.12972 therefore, it is said, criteria C8 is the main criterion in relation of partners in the inter-organizational cooperation and should be given more attention. The research result of Jamali and Hashemi (2011) and Jamali and Hashemi (2011) are consistent with the result of present study about the component of having tangible assets such as intangible assets.
- 9) Criterion C9 is a criterion that influenced on two criteria of C6 and C8 and affected from two criteria C5 and C6. According to assumption of DEMATEL techniques such as (D + R) = 2.3886 and (D-R) = -0.0394 therefore, it is said, criteria C9 is the core criterion in relation of partners in the inter-organizational cooperation. The research result of Christsen (2008) and Araz and Ozkarahan (2007) is consistent with the research result of present study about this issue.
- 10) Criterion C10 is a criterion that only influenced on criterion C5 and affected from two criteria C4 and C5. According to assumption of DEMATEL techniques such as (D + R) = 2.02302 and (D-R) = -0.15078 therefore, it is said, criteria C10 is the core criterion in relation of partners in the interorganizational cooperation. The research result of Mueller and Herstatt (2000) and Rounti and Mavridoglou (2005) is consistent with the research result of present study about the component of having willingness for sharing its expertise.

VIII. PROPOSALS

- *It is recommended that companies create relationships and inter-organizational cooperation that these companies have a competitive advantage and its own technology.
- *Having tangible assets such (financial resources), intangible assets (such as reputation for ...) is one of the main criteria in deciding for interorganizational cooperation. Therefore, it is suggested that contracts with organizations the signed cooperation that have tangible and intangible assets in acceptable range.
- *The research results showed that having special technical capabilities that help partners, have a particular importance for organizations that tend to have inter-organizational cooperation. Therefore, it is recommended that organizations that lack these important factors or are in low level strengthen their technical capabilities to be able to have inter-organizational cooperation with influential organizations.
- *Have a good market share in the industry is the features that in the relation of inter-organizational cooperation has a high impact on other factors. Therefore, it is suggested that organizations which are at a low level in this field, do appropriate action to improve it and organizations which are at an appropriate level in this field, for the partner selection, have a sufficient regard to this factor.
- *Having willingness to share its expertise with partners is also one of the important factors affecting on the success of the inter-organizational cooperation. An organization that isn't willing to share its expertise with other partners will have no positive impact on the partner so organizations should be aware that they can cooperate with companies to be able to exploit from their technical capabilities.

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