Identify the Effective Factors to Select the Appropriate Form of Collaboration between One Company and Other Companies in Information Technology Industry of Iran

Payam Hanafizadeh & Mina Rohani Tabatabai

Dept of Industrial Management, School of Management & Accountancy, Allame Tabataba'ee University (ATU), Nezami Ganjavi St., Tavanneer, Valy Asr Ave, Tehran, Iran, PO Box 14155-6479, hanafizadeh@gmail.com, minataba@hotmail.com

Seyed Ali Akbar Hosseini, Toseaye Gostaresh Chekad Pooyesh Company, No.126, 16th block, Second phase, Ekbatan, Tehran, Iran, T: (+98)9123196344, alhossein@hotmail.com

ABSTRACT

Collaboration between firms has developed at a tremendous rate over the last twenty years. There are different motivations for defining collaboration between firms such as marketing, accessing financial resources, learning new technologies and know-how. One of the incentives to cooperate with others is "external acquisition of technology". Choosing the appropriate form of collaboration is a strategic decision for management. There is a significant need for Iranian organization to access the new technology and know-how particularly in IT industries. In this research we survey the Iranian IT organizations' collaboration based on questionnaires. This research leads to find the factors affecting the choice of collaboration form in Iran, and the main motivations for collaboration in Iranian IT organizations.

1. INTRODUCTION

The literature on motivation for collaboration between firms is rich. Such as cost transaction (Williamson, 1991), reducing level of risk (Kogut, 1988; Hennart, 1988), increasing learning opportunity (Lei & Slocum, 1992), promoting innovation (Cohen & Levinthal). Another motivation which is focused in this research is technology acquisition. In the technology development activity, the decision is about whether to develop a new technology internally or acquire it from external resources (chiesa, 2002). The second means that the organization must establish a new relationship with the owner of the technology and it creates collaboration. There are several definitions of collaboration and cooperation in literature (Jolly, 2002. Chiesa, 2001. R. Culpan 1993. Verna, 1989). Chiesa mentioned 13 types of collaboration and he categorizes these 13 types to four categories according to organizational form of collaboration. These categories and short definition of them are as follows:

1. **Acquisition:** a company acquires another company in order to access a technology (or technological competence) of interest.
2. **Joint venture:** a company established a formal joint venture with equity involvement and a third company is created, with a definite objective of technological innovation.
3. **Outsourcing:** a company externalizes technological activities and, then, simply acquires the relative output.
4. **Alliance:** a company shares technological resources with other companies in order to achieve a common objective of technological innovation.

The difference between these four categories arises from the type of resources allocated by each partner, the property of the resources involved, the management of collaboration activities and the property of the output. The different organizational forms of collaboration have different managerial and organizational implication. Therefore when the decision maker has to select a definite form of collaboration he/she has to take into account such implications (Chiesa 2001).These managerial and organizational characteristics and its implication on different forms of collaboration is shown in Figure1.

The decision to definite the most appropriate form of collaboration depends on three categories of factors, which are specific to the collaboration and the partners involved:

1. the objectives of the collaboration
2. the content of the collaboration
3. the typology of partner involved

Figure1. Organizational and managerial implications of the different form of relationship (chiesa 2002)
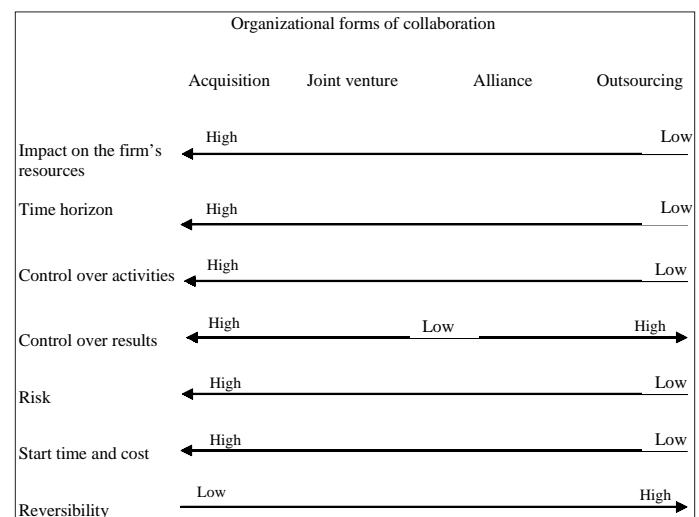
All the above factors have to be jointly considered to select an appropriate form of collaboration. Taking decision about the organizational form of technical co-operation is a complex process and needs a rational analysis in order to understand and balance factors of unequal influence.

In our research we define a simple model which is based on Chiesa. Table 1 shows the characters of each factor for the specific organizational forms of collaboration. Although these characters do not have a rigid boundary, we consider it as rigid to make our research feasible.

1.1. Hypothesis
The core proposition of this research is summarized in two questions. First, what are the effective factors to choose the appropriate organizational form of collaboration in Iranian IT companies? Second, what are the motivations for Iranian IT companies to use collaboration?

In order to answer the first question, we consider the factors which are stated with Chiesa (Table 1) as effective factors for choosing the appropriate organizational form of collaboration and then we tested these items for Iranian IT companies. These factors formulated as shown in Table 2.

Second question is focused on the motivations for using collaboration in Iranian IT companies.

2. METHODOLOGY
In this research we have surveyed the different forms of collaboration between firms. Among the various definitions and divisions, we selected the Chiesa definition because of its comprehensiveness. Two questionnaires were designed. In the first questionnaire we asked companies about the form of their collaboration. The second questionnaire combined from two parts. The first part asks companies about three categories of effective factors and the second part includes motivated elements and difficulties to use collaboration and Iranian IT companies were asked to rank these items in likert scale.

2.1. Data Sources
Data collection was based on questionnaires[1]. The first questionnaires were distributed among 400 IT companies' direct manager. After gathering the first questionnaires, the companies divided into four categories such as

- Acquisition's companies
- Joint venture's companies

Table 1. The Characters of each factor for the specific organizational forms of collaboration.

Category of factors	Factors	Acquisition	Joint Venture	Alliance	Outsourcing
Objective	Time Horizon	Long term	Long term	Mid term/short term	Short term
	Learning opportunity	Very Low	Very Low	High	Low
Content	Identificability	Good	good	bad	bad
	Familiarity	With market and technology	With market or technology	With market or technology	None
	Relevance for competitive advantage	High	High	Low	Low
	Technology life cycle	Embryonic	Embryonic	Growth	Maturity
	Level of risk	Low	Low	High	High
	Asset specialization	High	High	Low	Low
	Asset divisibility	High	High	Low	Low
Partner typology	Link with the firm	Vertical	Horizontal	Horizontal	Vertical
	Original country	Same	Same	Different	Different
	Size/power	Different	Different	Same	Same

Table 2. Hypothesis of each affecting factor

	Description
Hypothesis # 1	H_0: There is no relation between form of collaboration and objective time horizon
	H_1 : There is significant relation between form of collaboration and objective time horizon
Hypothesis #2	H_0: There is no relation between form of collaboration and learning
	H_1: There is significant relation between form of collaboration and learning
Hypothesis #3	H_0:There is no relation between form of collaboration and content identificablity
	H_1: There is significant relation between form of collaboration and content identificablity
Hypothesis # 4	H_0: There is no relation between form of collaboration and familiarity
	H_1: There is significant relation between form of collaboration and familiarity
Hypothesis # 5	H_0: There is no relation between form of collaboration and relevance for competitive advantage
	H_1: There is significant relation between form of collaboration and relevance for competitive advantage
Hypothesis # 6	H_0: There is no relation between form of collaboration and technology life cycle
	H_1: There is significant relation between form of collaboration and technology life cycle
Hypothesis # 7	H_0: There is no relation between form of collaboration and level of risk
	H_1: There is significant relation between form of collaboration and level of risk
Hypothesis # 8	H_0: There is no relation between form of collaboration and asset specialization
	H_1: There is significant relation between form of collaboration and asset specialization
Hypothesis # 9	H_0: There is no relation between form of collaboration and asset divisibility
	H_1: There is significant relation between form of collaboration and asset divisibility
Hypothesis # 10	H_0: There is no relation between form of collaboration and linking with partner
	H_1: There is significant relation between form of collaboration and linking with partner
Hypothesis # 11	H_0: There is no relation between form of collaboration and originality
	H_1: There is significant relation between form of collaboration and originality
Hypothesis # 12	H_0: There is no relation between form of collaboration and the power/size
	H_1: There is significant relation between form of collaboration and the power/size

- Alliance's companies
- Outsourcing companies

The second questionnaires distributed to each category separately, so we could analyze the character of each type of collaboration.

2.2. Sample and Respondents
In first step a total of 46 questionnaires were collected. The result is shown in Figure 2. Because of few samples in acquisition, we ignore it in next step of research. The second questionnaires were resent to three other categories of companies and the result was as follows: Joint venture includes 7 samples; Alliance includes 16 samples and Out-sourcing includes 7 samples.

2.3. Statistical Tests
In order to test hypothesis, each effective factor is defined as one variable. Relatedness between each variable and form of collaboration is tested by Chi-square by 95% probability.

2.4. Results
Results of Chi square test is shown in Table 3. The table shows the related and unrelated factors with the asymptomatic signal of X^2.

Related factors: results show that factors of this column are related to form of collaboration in Iranian IT companies and these factors affect choosing the appropriate form of collaboration.

Unrelated factors: this column shows the unrelated factors and our explanation is as follows:

Identificability: sometimes the content of the collaboration cannot be clearly defined. Most of the time, it happens when the collaboration is created to investigate on new technologies, products or special research. Among our samples a few companies are looking for such technological innovation. Most of the collaborations are established in order to use the mature technology.

Familiarity: the samples show that most of the IT companies' managers are familiar with market or technology involved in collaboration. Because this research is defined in IT industries and the collaboration is mainly looking for acquisition the IT, managers are supposed to be familiar with at least the market or the technology of assumed collaboration.

Figure 2. Rate of different form of collaboration based on 46 samples
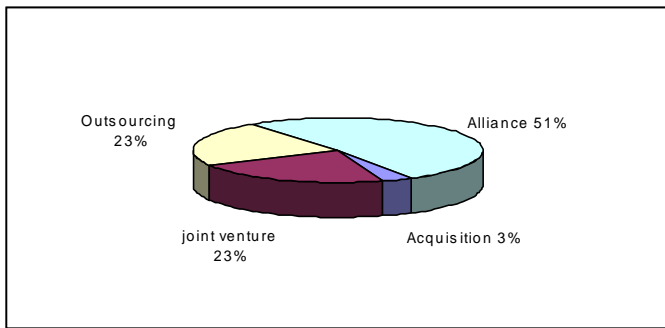
Technology life cycle: samples show that most of the Iranian IT companies develop collaboration in growth and mature phase of technology life cycle.

Link with the firm: reviewing the samples and discussion with two advisors shows that this factor doesn't affect the choice of collaboration as much as in other countries. Iran's market in IT industry differs from other countries. IT companies produce product at low cost so foreign IT companies can't collaborate with them to access the Iran market.

Original country: Collaboration between firms of different countries makes collaboration difficult. The different culture has impact on firm's organization and human resources. But the important fact is that IT companies and personnel of it are familiar with change because of the changing roll of IT (J. D. McKeen & H. A. Smith, 2003). So it may have lower effect on IT companies.

As it was mentioned in methodology, we asked Iranian IT managers to rank motivations and difficulties in using collaboration in Iran. Figure 3 shows motivation for creating collaboration in Iranian IT companies. The results state that there are two main motivations for Iranian IT companies. First, gaining a better reputation from using a partner's brand and second is access know-how and promote new knowledge and learning.

Figure 4 shows the difficulties of using collaboration in Iran. Again we have two main difficulties: lack of suitable internal partner and governmental and legal limitations.

Table 3. Related and unrelated factor base on testes
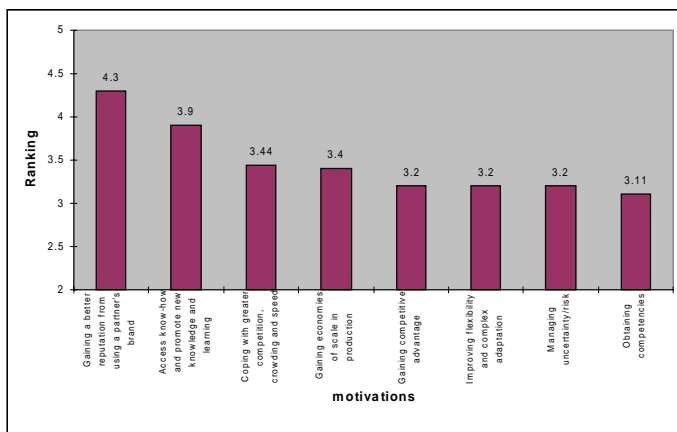
Related Factors	Asymp. Sig.	Unrelated factors	Asymp. Sig.
Time Horizon	0.001	Identificability	0.054
Learning	0.002	Familiarity	0.596
Relevance for competitive advantage	0.001	Technology life cycle	0.176
Level of risk	0.004	Link with the firm	0.343
Asset specialization	0.012	Original country	0.114
Asset divisibility	0.018		
Size/power	0.001		

3. CONCLUSION

In this research we considered 46 Iranian IT companies as statistical samples. Their collaboration's organizational form was determined and characters of factors affecting the choice of the collaboration's form were tested. IT has some special characters. For instance it is changing issue and it expands day by day. So IT companies need a form of collaboration that satisfied their learning needs. It is necessary to mention that IT can be a useful tool to make relationship between firms, control the relation and thus lead to increase learning opportunities. It is more important for Iranian IT companies, because one of their main motivations for collaboration is to increase knowledge and know-how. As the research shows there are some differences in factors affecting the choosing of appropriate collaboration in Iranian IT companies. This research states that factors such as identificability, familiarity, technology life cycle, linking with firms and originality do not affect on choice of collaboration forms in Iranian IT companies.

This research has some limitations. It was carried out just in one Industry, the sample size is very small, data is collected by questionnaires and only one collaboration of each company is considered .The results is important and valuable because there isn't much research on this topic in Iran, but it can't be generalized because of the mentioned limitations. More research and study is needed in order to accept the results for whole Iranian IT companies.
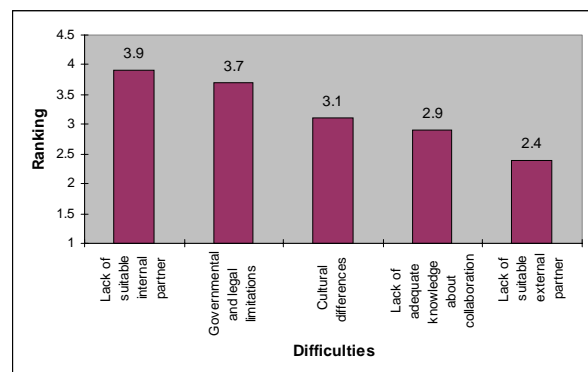
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Figure 3. Average of motivations ranking

Figure 4. Average of difficulties ranking

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ENDNOTE

[1] Questionnaires are available on request.

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