

Designing an Inter-organizational Cooperation Management Model in Oil Companies

Ali Porseshbin^a, Mohammadreza Bagherzadeh^{*b}, Assadollah Mehrara^b, and Yousof Gholi Pourkanani^c

^aPhD Candidate in Public Administration, Department of Public Administration, Islamic Azad University, Qaemshahr Branch, Qaemshahr, Iran, 09124096795, (Porseshbin468@gmail.com)

^bAssistant Professor, Department of Public Administration, Islamic Azad University, Qaemshahr Branch, Qaemshahr, Iran

^cAssistant Professor, Department of Industrial Engineering, Islamic Azad University, Qaemshahr Branch, Qaemshahr, Iran, 09113116096. (Gholipourkanani@yahoo.com)

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ABSTRACT

The present study aimed to provide an inter-organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone. This study was conducted in two stages of conceptual research framework design and conceptual framework validation. In the first part, the population included the senior managers of oil companies in the Pars Energy Special Economic Zone and 10 subjects were selected as the sample. In the second part, the population included all of the employees, from whom 116 samples were selected. To collect data, Delphi questionnaire was used, along with a questionnaire with a 5-point Likert scale after identifying the components, indicators, and criteria. The validity of the questionnaire was confirmed using CVR index, as well as exploratory and confirmatory factor analysis while its reliability was evaluated using Cronbach's alpha. Data analysis was performed using Delphi technique, one-sample t-test, and structural equation modeling in SPSS and Lisrel statistical software. Based on the obtained results, four dimensions, 17 components, and 63 indicators were identified for the inter-organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone. Environmental, cultural, organizational, and leadership style dimensions are known as the dimensions of inter-organizational cooperation management in oil companies in the Pars Energy Special Economic Zone. Such factors had the most significance among the identified dimensions of environmental dimension with load factor of 0.99, cultural dimension with load factor of 0.82, organizational dimension with load factor of 0.79 and leadership style dimension load factor of 0.89, respectively, than other dimensions to the concept of inter-organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone. The results

indicated that the designing the inter-organizational cooperation management model is divided into four dimensions of environmental, leadership, cultural and organizational dimensions. Environmental dimension includes political, business process, economic, developmental, legal, and technology. Cultural dimension includes the components of conflict management, information sharing, participation, and commitment. Organizational dimension includes the components of philosophy, processes, coordination, and strategy. Leadership style dimension encompasses the components of collaborative leadership, multidisciplinary decision making, and adaptation to management style.

1. Introduction

In today's complicated conditions, especially resulting from the lack of resources and increased costs, inter-organizational cooperation is required and the success of inter-organizational cooperation depends on the preparation of effective frameworks for inter-organizational cooperation. Studies have almost failed to address the necessity for inter-organizational cooperation and the effective constructive frameworks of such cooperation, especially where the cooperation is not directly aimed at increasing the revenue or reducing the costs of the cooperation (Khosravi & Jaafari, 2020). In most studies, only the statistics on the success or failure of the inter-organizational cooperation has been mentioned. Inter-organizational cooperation is not limited to the private sector and has become increasingly common among government agencies, charities, and non-governmental organizations during the recent years because society will take more advantage from the benefits of this cooperation and inter-organizational coordination (Conteh, 2013)

Despite the benefits of inter-organizational collaboration in various projects, it should also be noted that many organizations fail to enter the field due to the problems in its management. Inter-organizational communication and cooperation fails to guarantee the achievement of privileges and does not always mean success as different figures in references referred to the failure of inter-organizational cooperation and for reasons such as inconsistencies between norms and goals, insufficient environmental pressure, lack of open cooperation due to cultural differences, lack of trust and referral to resource dependence and the general lack of measured frameworks (Biermann, 2015). Such problems have a greater effect in a situation where the project of joint inter-organizational cooperation has large dimensions and is highly complex (Jabarzadeh Karbasi et al., 2019).

Although some emphasized the interdependence of organizations and the need for coordination between them to improve performance (Pennec et al., 2018; Pouwels et al., 2017; Bengtsson and Raza-Ullah, 2016; KOŽUCH et al., 2016; Ye et al., 2013; Pouwels, 2012; Conteh, 2012; Chen Li and Len, 2013), there are few studies on the management of inter-organizational cooperation in the public sector. This study aimed to develop this field by developing tools and presenting an appropriate model for measuring inter-organizational cooperation and identifying the factors affecting its promotion and cooperation model. The main focus is on modern industrial organizations, especially the oil, gas, and petrochemical industries.

Thus, the Pars Energy Special Economic Zone is the largest specialized economic zone in the oil, gas, and petrochemical industries and is a wide range of downstream, mixed, and semi-heavy industries, as well as service and commercial uses in the world (Zareie, et, al, 2020). This organization on behalf of the Ministry of Oil and the National Iranian Oil Company is in charge of managing the South Pars, Pars Kangan, and North Pars operational areas. The main activities include definition, approval (design, implementation, operation, and maintenance), and construction of public infrastructure such as railway, port, airport, water, electricity, and management of the region. Thus, the basic objectives of establishing the Pars Energy Special Economic Zone Organization are providing the necessary conditions to take comparative advantages in the field of oil and gas industry, creating the necessary infrastructure for the presence of domestic and foreign investments in the downstream petrochemical industries, mixed industries, semi-heavy industries, using upstream gas and petrochemical industries to create added value, improving employment and increasing national income, importing foreign technology and new management knowledge, using the region's transit capacities to support the sector, encouraging investors to implement investment projects, developing the special zone,



expanding and increasing the level of cultural, sports, health and medical services for residents, and finally performing the comprehensive and sustainable development of the special zone focused on human development (Vahedi, et.al, 2020). One of the major challenges of companies located on the Special Zone including parent companies specializing in oil, gas and petrochemical and downstream industries is the lack of a definite structure for organizing inter-organizational relations based on an interactive approach (Dara; Moghadas and Lalalizadeh, 2020:).

In this regard, inconsistency among executive organizations is one of the major management issues in oil companies in the Pars Energy Special Economic Zone, which appears in crisis conditions, integrated management of oil areas, etc. The reluctance or inability of policy makers to develop comprehensive policies is considered as one of these factors. Based on organizational and management consequences (risk, start-up time and cost, amount of control, etc.), environmental conditions, partner companies and the role of each, the degree of formality and transparency of cooperation, type of allocated resources, as well as the management of operations, activities, and ownership of results and outputs in the use of modern technologies play an essential role in inter-organizational cooperation. However, this inter-organizational cooperation means taking steps towards formulating policies and strategies to overcome the challenges of inconsistencies and probable crises between the oil companies in the Pars Energy Special Economic Zone that the effect of each company on each other is very high. Due to the lack of research on designing an inter-organizational cooperation management model, identifying the factors affecting the inter-organizational cooperation and inter-organizational cooperation management can be effective and helpful. Based on the above-mentioned description, the problem is that the desired objectives have not been achieved yet despite the efforts of human resources and management of inter-organizational cooperation (Nasresfahani & Rasoulinezhad, 2020). Accordingly, this study seeks to whether it is possible to achieve a comprehensive management model for inter-organizational cooperation for oil companies in the Pars Energy Special Economic Zone. Based on which elements, this model can be designed and what is the relationship between the elements of this model?

Considering the role and significance of the managers of an organization in the life and success of cooperation in oil companies in the Pars Energy Special Economic Zone, inter-organizational cooperation management can

play an important role in different stages of value chain and in each of the research sectors, product development, production, marketing and distribution, and after-sales service. Therefore, the significance and necessity of designing a management model for inter-organizational cooperation in oil companies in the Pars Energy Special Economic Zone is as follows:

- The development of inter-organizational cooperation management can provide organizations with an appropriate solution to achieve sustainable competitive advantage in today's dynamic and rapidly changing environments.

- Considering that the conducted studies have been formed on inter-organizational cooperation and the design of the management model of inter-organizational cooperation has been neglected, the researcher intends to model based on inter-organizational cooperation management.

- Considering that the oil companies of the Pars Energy Special Economic Zone have dedicated one of their major goals to cooperation, implementing the results of this study and observing its effect in the short term, will greatly contribute to the high goals of the company. In addition, it can be a mechanism for leveraging competencies. Thus, it increases survival in turbulent market conditions. Some concerns such as identifying the ways to control costs, improving quality for organizations facing pressure in a competitive environment, increasing effectiveness, and especially risk management can be a great help.

- Success of implementing this model in oil companies in the Pars Energy Special Economic Zone can be a basis for using this model in other similar companies.

As mentioned at the beginning, the present study will be conducted with the aim of presenting a model for managing inter-organizational cooperation in oil companies of Pars Energy Special Economic Zone. Therefore, initially in two stages of conceptual framework design, research and validation of the conceptual framework will be done. In the first and second part, the statistical population will be selected from the senior managers and all employees of oil companies in the Pars Energy Special Economic Zone. In the third stage, in order to collect information from the Delphi questionnaire and after identifying the components, indicators and criteria to confirm them, a questionnaire with a 5-point Likert scale will be used. The validity of the questionnaire will be evaluated using

CVR index and exploratory and confirmatory factor analysis and its reliability will be evaluated using Cronbach's alpha. In the fourth step, data analysis will be performed using Delphi technique, one-sample t-test and structural equation model in SPSS and Lisrel statistical software, so that the authors can design components and indicators of collaboration management model Inter-organizational in oil companies to do Pars Energy Special Economic Zone.

2. Research background

Although extensive studies have been conducted on cooperation, no comprehensive theory has been proposed for inter-organizational cooperation. The conceptual structures, applied methods, data and experimental findings mentioned in the studies are very diverse. In fact, cooperation has been portrayed from different angles. Evaluating these attitudes help us to understand more about inter-organizational cooperation and its success factors. There are few sources on the research subject. Here are some of the previous studies which addressed this issue:

Jabbarzadeh Karbasi et al. (2017) indicated that the commitment of top management, communications, motivation, shared vision, interpersonal relations, aligned goals, culture of cooperation, trust, joint planning, power distribution, conflict management, creation of control and monitoring systems, creation of information systems, and the non-consideration of on economic-political considerations affect the effectiveness of inter-organizational cooperation. In addition, based on this model, the effectiveness of inter-organizational cooperation can be effective in creating value and business success.

Behmanesh Shakib et al. (2017) confirmed that inter-organizational cooperation in the strategic management of natural disasters is affected by integrated command, communication management, information management, and resources management. Musa Khani et al. (2014) analyzed the maturity models, five levels of independent, temporary, coordinated, standardized, and optimized were obtained. Then, seven dimensions of structure, behavior, process, data and information, strategy, systems and innovation, as well as 25 indicators were extracted using the "design science" approach and "meta-synthesis" methodology. Pennec et al. (2018) reported that businesses, policymakers, and researchers have supported the need to create value potentially through inter-organizational cooperation. Pouwels et al. (2017) showed that cost transfer and inter-organizational trust

are the determinants of cooperation for buyers. Uncertainty in technology and the return of relationships are significant determinants for suppliers. In both sets of samples, the stability of goal significantly affects the inter-organizational cooperation. Ye et al. (2013) retrieved scientific documents based on organizational affiliation, and co-authors from the science citation database calculated the T-index (UIG) for different countries. In addition, they analyzed the effect of globalization on inter-organizational cooperation, especially in the US and China.

3. Theoretical literature

3.1. Inter-organizational cooperation

The concept of cooperation in Webster's Dictionary (1828) was translated as the process of organizing individuals or groups so that they could work together appropriately, and harmonious functioning of components for effective results. Several definitions of cooperation have been raised in management literature. Some researchers consider cooperation as the process of achieving specific goals by working together, while others consider cooperation as a consequence of this process (Alexander, 1995).

Cooperation is a process in which individuals or organizations often work together through sharing knowledge, learning, and building consensus at a common intersection of goals. In cooperative processes, individuals or organizations build the relationships in which organizations act based on honest cooperation to achieve a common goal and are characterized by trust and commitment, according to which its durability varies according to its nature (Dietrich et al., 2010: 60). Matsic and Monsi have defined inter-organizational cooperation in a beneficial relationship defined by two or more organizations to achieve common goals. Such a relationship includes commitment to defining interrelationships and goals, creating a common structure and shared responsibility, having mutual responsibility and accountability for success, and sharing resources and rewards (Le Pennec et al., 2016).

Hokor et al. (2011) identified five elements of purpose and strategy, incentives, individuals, side mechanisms such as building social capital, and structure for cooperation. In their study, Thompson and Perry considered five elements of governance, management, organizational independence, interrelationships, and norms as the elements of cooperation.



In his typology of inter-organizational relationships, Witen introduced four main forms of two-way communication, organizational set, action set, and network. Two-way communication refers to cooperation between two independent organizations with limited resources (Le Pennec et al., 2016). Organizational set refers to a set of inter-organizational relationships by the central organization, known as the central organization. Action set refers to a system of firms which pursues a specific goal. Finally, a network is a kind of policy subsystem including different combinations of inter-organizational relationships (Conteh, 2013; Jabbarzadeh Karbasi et al., 2019).

3.1.1. Factors affecting inter-organizational cooperation:

Due to the needs of today's competitive market and global trade, using alliances has increased significantly. Based on the previous studies, partner selection has been mentioned as one of the key parts of forming inter-organizational cooperation (Hocevar and Jansen, 2011). Every cooperation begins with the analysis of potential partners and the realization of the benefits of inter-organizational cooperation depends on the correct choice of partners (Verdacho, 2011). More companies have shifted to inter-organizational cooperation and strategic alliances over the past decade, but a significant number of such alliances have failed (Hain and Beck, 2010). The lack of cooperation and compatibility between partners is one of the most important reasons for the failure of inter-organizational cooperation. Decision-making process related to the partner selection is highly complex and challenging, especially when we look at the high failure rate of alliances (Musa Khani, 2014).

Criteria for partner selection vary in different countries different business regions according to political conditions and business regulations (Shojaei, 2013). Based on the field of activities and the type of inter-organizational cooperation, such criteria can be somewhat different. Nielsen has stated this issue in his study. For example, the knowledge of access to local rules and regulations for partner selection by Danish companies has been mentioned as a minor factor in relation to Western Europe. However, this factor is more important in American companies than in Asian companies and other parts of the world. (Jamali and Hashemi, 2011).

3.1.2. Theories describing inter-organizational cooperation

Although extensive studies have been conducted on cooperation, no comprehensive theory for has been proposed inter-organizational cooperation yet. The conceptual structures, applied methods, data, and empirical findings cited in the above-mentioned studies are diverse. In fact, cooperation was portrayed from different angles in these studies. Evaluating these attitudes helps us to understand more about inter-organizational cooperation and its success factors (Hoffman, 2001).

3.1.2.1. Cost - trade theory

The cost-trade theory was first proposed in 1930 (Kaz, 1997). This theory sought to answer the major question of why some activities, whether providing a service or producing a product, should occur in an organization, while others take place in the market. This question, despite its significance, remained unanswered until about 1970.

After this period, there were those who developed this idea such as Oliver Williamson (1975 and 1993), who devoted about 25 years of his scientific work to trade theory. He divided the question raised above in form of the following two questions:

- A) Why do organizations exist?
- B) Why do not all activities occur in a large organization?

His answer to these two questions was that trade costs determine what needs to be fulfilled in the organization and what needs to be fulfilled outside the market. According to Williamson, the most significant trade costs related to the market are the cost of pricing services and products, negotiating with a beneficiary outside the organization, the cost of signing contracts and filling the information gap. He considered the most critical trade costs related to the organization in form of administrative for answering to questions such as "what", "when" and "how" in selecting and conducting activities, costs due to misallocation of resources, and costs due to low employee motivation, especially in large companies (Morgan, 1986).

The classification of trade costs in the organization and the market indicated that the factors affecting trade costs are related to a set of human and environmental factors and they can be classified into three groups (Jones

1988; Klein, 1987; Lawler, 1992). Such factors are as follows:

- Environmental uncertainty and limited rationality
- Opportunism (abuse) and the small number of actors in the field of trade
- Special assets and risk

This theory proposes the selection of organizational form which reduces fixed and variable trade costs. Cooperation is the most effective form of organization in this discussion (Hoffman, 2001: 358).

3.1.2.2. Resource-based theory

This theory considers the organization as a set of resources such as capital, capabilities, and processes. Cooperation arises when a company needs more resources and cannot procure them from the market at an acceptable price, risk, and time (Hoffman, 2001: 359).

Resource-based theory allows researchers to understand how companies can achieve their key strategic goals, create or strengthen competitive advantage, and thereby increase their economic benefits and profitability through cooperation. The resources of strengthening advantage should be valuable, durable, and difficult to copy or, if copied, they can be quickly compensated. Cooperation is mainly a means of expanding a company's capabilities by connecting with other companies (Tunsand, 2003). Non-harmonious (tangible or intangible) resources of the company are a potential source of competitive advantage. Based on this theory, companies use cooperation to create an optimal combination of resources which are more valuable than other possible combinations. Thus, cooperation can contribute to the development of resources which creates value and the company alone cannot create such resources (Ireland, 2002).

3.1.2.3. Knowledge-based theory

The development of strategic management thinking is affected by the significance of the economic role of knowledge to some extent. The organizations which can leverage knowledge and make significant use of implicit knowledge are more likely to combine traditional resources and capabilities in new and distinct ways to provide more value to their customers than their competitors. The prospect of using knowledge as a primary source of competitive advantage is known as the knowledge-based perspective, which arises from the development of a resource-based perspective. The

limitation of the knowledge-based attitude is that it considers both implicit and explicit knowledge as the things which are objectively definable. Based on knowledge-based theory, knowledge is a static internal resource in organizations which can be controlled, used, and traded like most physical resources. As a result, information systems are often developed in an effort to capture, store, improve, and transfer knowledge between units, departments, organizations, and individuals.

Although the fact that knowledge-based theory considers knowledge as an asset is a significant concept, this perception has been significantly distorted by the fact that it puts great emphasis on the development of information technology. This issue limits the understanding of intellectual dimensions, especially tacit knowledge for value creation in non-profit organizations (Motalebi Asl, 2008). Cooperation is the best environment for creating value through the exchange or combination of scattered knowledge. The companies facing uncertain environments can use cooperation to accelerate organizational learning, reshape their environment, and reduce strategic ambiguities (Hoffman, 2001).

3.1.2.4. Network-based theory

Chen (2002) examined one of the most essential types of inter-organizational cooperation, i.e., strategic cooperation from a network-based perspective. Accordingly, all companies are located in one or more networks and work together to create value. No company is big enough to be fully independent. Resource sharing is a necessity, not a choice. The philosophy of strategic cooperation is to create a formal and lasting relationship between partners, so that the exchange of resources is facilitated. Thus, strategic cooperation addresses long-term needs rather than short-term ones. A network approach is a process approach in which dynamic changes are magnified. In this attitude, strategic cooperation is not regarded as a competition between partners to share common or distinct resources with the aim of reducing transfer costs, but as a formal agreement between partners to invest in relationships and exchange resources.

Therefore, partners should invest in learning and adaptation to form cooperation and gradually introduce a resource exchange mechanism. Experimental studies have indicated that effective learning and adaptability between partners are among the most significant factors for cooperation success. The creation of a strategic cooperation demonstrates a commitment to investing in



specific relationship assets with the potential to increase the competitiveness of partners by reducing the total cost of the value chain, increasing product differentiation, reducing errors and accelerating product development time.

However, investing on these special relationships increases the mutual dependence between the partners as well as their vulnerability. Thus, such investments should be accompanied by preconditions. For instance, reputation and level of trust between partners are significant preconditions for the formation of cooperation. In this attitude, the emphasis is on organizational integrity and commitment of resources, increasing through trust, while in the traditional attitude, the emphasis was on control.

Smith, Carroll, and Ashford categorized cooperation theories into five categories as follows.

1-Exchange theory

Exchange theories are among the theories in which cooperation is regarded as a tool for maximizing economic or psychological benefits. Such theories are applied in the fields of psychology, sociology, political science, and economics and these different fields have similar approaches to the relationship between the exchange process and cooperation. Related groups tend to cooperate when the benefits outweigh the costs. Some of the exchange theories include exchange cost theory, social psychology of exchange theories, micro and macro theories of exchange sociology, reinforcement theory, symbolic interaction theory, and rational or normative decision theories. Exchange theories have very good conscious reasons which make groups come together for cooperation and maintain their cooperative relationship.

2-Attraction theories

Such theories emphasize what attracts individuals and groups to each other and the establishment of their natural interest and connection. Although these theories overlap with exchange theories, provide the modeling of cooperative relationships based on unaccounted and non-economic benefits and costs. These theories emphasize the non-economic aspects of relationship formation.

3-Theories of power and conflict

Some scientists have emphasized the tendency to conflict or the opposite – i.e. cooperation. In this on the existing literature on inter-organizational cooperation management. Then, some experienced

framework, the diversity of goals, values, and resources which can lead to injustice or oppression represents a conflict. Such theories overlap with attraction theories but are highly useful for predicting the dynamics of relationships over time. For example, the greater the power difference between related groups, the more formal cooperation required than the informal form.

4-Modeling theories

Such theories emphasize the process of social learning and its significance or modeling in the emergence of cooperation between individuals and organizations. Thus, some cooperative behaviors or arrangements arise because individuals, groups, or organizations act accordingly and give them a legal dimension accordingly.

These theories emphasize the significance of adaptation, coherence, and the creation of behavioral norms based on cooperation through pre-planned social, organizational, and group cultures. As an important point, such theories point to predictive factors which are beyond cooperation.

5-Theories of social structure

These theories emphasize the role of structural factors in the emergence of cooperation and explain the emergence of cooperation relations in terms of the general conditions of the system in which they occur. Structures consist of the social status of individuals, groups, organizations, and networks which are interrelated while distinguished from each other. Social variables can be the number of colleagues, homogeneity and heterogeneity, distance, history, and power. These theories consider the external dimensions of a relationship to predict cooperation like modeling theories. Network theory, as a well-known example of social structure theories, explains cooperation based on the position of colleagues in a network of relationships (Smith et al., 1995).

5. Method

The present study investigated the practical methods and presented a management model for inter-organizational cooperation in oil companies of the Pars Energy Special Economic Zone. Thus, this study had an integrated approach which was used both qualitatively and quantitatively by deductive and inductive methods. In this study, first the initial content was prepared based experts and managers of oil companies along with a qualitative description of the management of inter-

organizational cooperation from the mental conditions about the desired people selected the options extracted from the literature according to their adaptation to the conditions in oil companies. Content analysis was conducted based on agreement tables between responses and their coding on qualitative responses along with components extracted from the literature. In the second stage, it was considered as a reserve to assess the overall management of inter-organizational cooperation and then distributed randomly in the population through a questionnaire. The results of this step were extracted as different structures using exploratory factor analysis and then were examined using confirmatory factor analysis. Accordingly, the population included quantitative and qualitative groups. The population in the quantitative part included 10 senior managers and experts of oil companies who participated as a decision team in identifying the components and indicators of inter-organizational cooperation in this study. The statistical population in the qualitative section included 168 employees of oil companies in the Pars Energy Special Economic Zone in 2020. The statistical sample of the

study was divided into two groups based on the population, so that the census method was used to determine the volume of the first group (N=10). For the second group, Krejcie and Morgan table was used, thus the sample size of the second group was determined as 116 and 135 questionnaires were distributed. Of these questionnaires, 116 healthy questionnaires were collected by random sampling after distribution among the sample. Library studies and field research were used to collect data. Books, theses, and scientific articles were used in the library studies while a questionnaire was used in the field section. For this purpose, a researcher-made questionnaire was used based on the results of the qualitative step including 63 questions in a 5-point Likert scale

The validity of the questionnaire was evaluated and confirmed by CVR index and confirmatory factor analysis. The reliability of the questionnaire was confirmed by Cronbach's alpha (0.833). The relevant results are shown in Table 1.

Table 1: Validity and reliability indicators.

Dimension	CVR	Cronbach's Alpha
Environmental	82/58	0/89
Cultural	82/73	0/78
Organizational	80/17	0/84
Leadership	87/88	0/86

The results of CVR showed that it was higher than 0.5 for all dimensions, indicating the content validity of the research tool. The composite reliability CR was calculated higher than 0.7, as a necessary condition for the validity of internal consistency and correlation of structures. In addition, Cronbach's alpha of all components was greater than 0.7, confirming the reliability of all components. In order to analyze the data, this study used content analysis and Delphi technique, Kolmogorov-Smirnov test, confirmatory and exploratory factor analysis and structural equation model in Lisrel and SPSS software.

6. Findings

6.1. Findings from content analysis and Delphi technique

First, content analysis method and Delphi technique were used to identify the indicators of inter-organizational cooperation management, in which the opinions of experts were used. In the content analysis section, the interviews were reviewed and the basis for identifying inter-organizational cooperation management indicators was provided. In this section, 70 basic categories were identified. Then, the identified categories were confirmed using the opinion of experts and the Delphi technique. In the first round of the Delphi method, a questionnaire was first designed using the identified indicators. Then, the designed questionnaire



was distributed among 10 identified experts and then returned. Based on the average opinions of experts for each question, it was found that out of seven questions or indicators from 70 questions had a lower average than the average of the range, i.e. 3. Thus, these criteria were removed and the rest were known as the significant criteria. In order to examine the condition of consensus among experts, at least 70% of experts should have given the same answer to one of the answer options for each question. The general survey of the consensus among experts indicated that some consensus has not been reached yet. In the second round of the Delphi method, a new questionnaire was designed using the results obtained in the first round. The questionnaire was provided to the experts along with the results of the first round of the study. Then, the second round of the questionnaires was collected and analyzed. In the second round, no new indicators were introduced by the experts, indicating that the indicators presented in the questionnaire covered all aspects of the study. The general review of the consensus among experts indicated that the consensus in the second round increased compared to the first period and 70% of the consensus on the questions was reached and the indicators were considered as significant. The questionnaire was provided to the experts along with the results of the second round. Then, the questionnaires of the third round were collected and analyzed. In the third round of the study, no new indicators were introduced by experts as in the previous round, indicating that the indicators

presented in the questionnaire covered all aspects of the study.

The consensus increased among experts in the third round compared to the second round, so that all of the questions had the desired degree of consensus, i.e. 70% of consensus. Based on the results, the condition of consensus among experts was accepted in the third round.

Finally, 63 final indicators were identified among 17 criteria and four dimensions.

6.2. Descriptive statistics

Among 116 participants, 33.62% were 30-40 years old, 41.38% were 40-50 years old, and 22.59.00% were over 50 years old. In addition, 18.10% worked for less than 10 years, 53.45% have worked for 10-20 years, and 28.45% worked for more than 20 years. In addition, 30.17% had a bachelor's degree, 61.21% had a master's degree, and 8.62% had a PhD. Furthermore, 40.18% of people were female and 59.82% were male.

6.3. Findings from structural equation modeling

The structural equation model was used in Lisrel software to develop an inter-organizational cooperation management model. The results of the relevant structural equation model are shown in Fig. 1.

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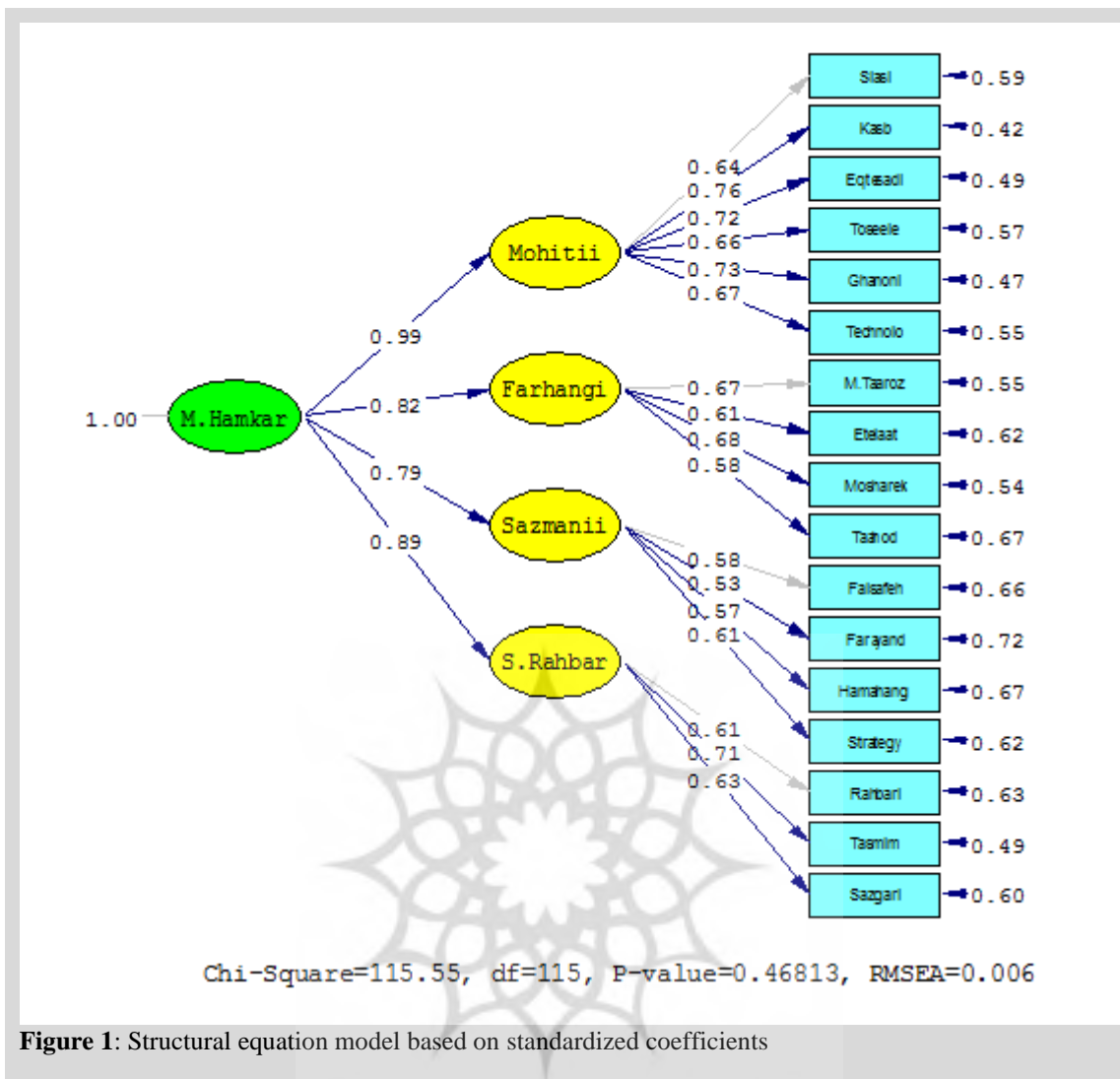


Figure 1: Structural equation model based on standardized coefficients

In general, the main features of inter-organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone in Iran's petrochemical industry are as follows.

First, there are some specific innovations of this model in comparison to other inter-organizational cooperation management models in oil companies in the Pars Energy Special Economic Zone.

Second, the possibility of establishing inter-organizational cooperation management in oil companies in the Pars Energy Special Economic Zone in terms of components identified for inter-organizational cooperation management in oil companies in the Pars Energy Special Economic Zone in this study can conform the capability of this industry in the field of inter-organizational cooperation management.

7. Conclusion

Based on the results, four dimensions, 17 components, and 63 indicators were identified for the inter-organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone. Environmental, cultural, organizational and leadership style dimensions are known as the dimensions of inter-organizational cooperation management in oil companies in the Pars Energy Special Economic Zone and are the most significant among the identified dimensions. Among the identified dimensions, the environmental dimension of inter-organizational cooperation management in oil companies in the Pars Energy Special Economic Zone with load factor 0.99, cultural dimension with load factor 0.82, organizational dimension load factor 0.79, and the leadership style with load factor 0.89, respectively, had a more sense of belonging than other dimensions to the concept of inter-



organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone.

The results of this study are consistent with the results of the study by Jabarzadeh Karbasi et al. (2019).

In addition, the results of Sheikhol-Eslam et al. (2017) are consistent with those of this study in terms of organizational, legal, political, cultural and environmental components. Behmanesh Shakib et al. (2017) conducted a study entitled "A theoretical model of inter-organizational cooperation in the strategic management of natural crises with the meta-synthesis method" which is in line with the results of the present study in terms of legal, organizational and environmental components. Regarding components, strategies, and systems, the result of this study is consistent with that of Ghasempour et al. (2014). In addition, the results of Shojaei et al. (2013) are in line with those of this study in terms of technology and organizational components. The results of data analysis indicated that the inter-organizational cooperation management model in oil companies in the Pars Energy Special Economic Zone includes four dimensions of environmental, organizational, cultural, and leadership style. Environmental dimension includes political, business process, economic, developmental, legal, technology. Cultural dimension includes the components of conflict management, information sharing, participation and commitment. Organizational dimension includes the components of philosophy, processes, coordination and strategy. The leadership style includes the components of cooperative leadership, multidisciplinary decision making, and adaptation to management style. The political component includes indicators of regional, national and strategic policies, political considerations, the general political structure of the country, as well as the influence of some representatives and the main shareholder. The component of business process includes indicators of export expansion, increase of production, increase in employment, accumulation of capital, increase of production and export, improvement in national economy, and providing conditions for investment. Economic component includes attracting domestic and foreign capital, increasing income and reducing costs, lack of financial resources, economic business interactions, development of economic activity, as well as support for good investment. Development component includes organizational leadership, organizational development, organizational synergy, moving towards value creation, legal component including indicators of rules and regulations, internal rules of the organization, enforceability, reduction of

administrative formalities and easy follow-up. Technology component includes mechanization of affairs, use of business intelligence mechanism, creation of infrastructures, general control of equipment collection, component of conflict management including indicators of reduction in inter-organizational contradictions, closer organizations, as well as reduction of organizational misunderstandings. Shared information includes creating integrated databases, visualization in information system, technical knowledge, and participation component including indicators of participatory management, social responsibility, sharing experiences, commitment, voluntary affairs, responsibility, and organizational commitment, philosophy component such as the indicators of organizational development, organizational support, and public service delivery. Process includes the processes governing the organization, performance improvement, and acceleration of activities, coordination includes inter-organizational relationship training, communication platforms and necessary infrastructure, and organizational flexibility in creating relationships. Strategy includes organizational strategy components, use of opportunities, threat management, and cooperation leadership component including organizational manager strategy indicators, manpower communication management, and leadership perspective. Multidisciplinary decision includes management decision integration, decision making in crisis situations, and risk taking in decision-making.

Adaptation with management style includes alignment of management style and leadership of the organization, as well as organizational development programs of leadership and managers' willingness to cooperate.

The results of this study are consistent with the results of Jabarzadeh Karbasi et al. (2019) in terms of commitment, communication, culture, conflict management, and creation of information, political, and economic systems. Further, the results are in line with those of Sheikhol-Eslam et al. (2017) regarding organizational, legal, political, cultural and environmental components. In another study, Behmanesh Shakib et al. (2017) conducted a study on the theoretical model of inter-organizational cooperation in the strategic management of natural crises with the meta-synthesis method, the result of which is consistent in terms of legal, organizational and environmental components.

Regarding components, strategies and systems in this study, the results are in line with those of Ghasempour et al. (2014). Finally, the result of Shojaei et al. (2013) is consistent in terms of technology and organizational components.

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