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Dynamic Capability Improvement Model in the Field of International Markets in Iranian Oil and Gas Industry

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ABSTRACT

One of the main approaches in capacity building and strengthening organizational abilities to integrate activities along the supply chains is the integration, creation, and reconfiguration of internal and external capabilities of components based on the theory of dynamic capabilities. The main assumptions of this theory are based on the purposeful strengthening and promotion of organizational capacities to improve the executive capability of human resources. The objective of this study is to provide a model for promoting dynamic capabilities for international markets of Iran's oil and gas industry. The statistical population includes managers and experts in the field of oil and gas working in the affiliated organizations in Iran. Data were collected using a researcher-made questionnaire whose validity was verified by the content method and its reliability was examined and verified by test-retest method with Spearman correlation coefficient of 0.877 and internal consistency was verified using Cronbach's alpha coefficient. Based on the findings, the dynamic capabilities model was formed on 24 primary factors that were classified into 7 main components. In addition, these components were further classified into four main categories based on the competence-emergency matrix. According to the results, "Strategic conducting of capital resources" accounted for 19.78% of explanatory power and was the most important factor in promoting dynamic capabilities. The findings of the present study can be useful for decision-makers to promote competitiveness in terms of dynamic capabilities in Iran's oil and gas industry.

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1. Introduction

The speed of changes in energy markets along with the emergence of regional and global crises as well as revisions in approaches, policies, diversity in technology and market needs and expectations, have driven the production and operations cycles in energy supply chains, especially petroleum products towards capacity building for alternative value-creating programs with minimal resources with making maximum changes (Hong, Zhang, & Ding, 2018; Masteika & inskepinskis, 2015). This leads organizations active in this field to build capacity and strengthen the power in integrating activities along the chain of values, integrating, creating as well as readjusting their internal and external capabilities.

Extraction, processing, transmission, and distribution processes of oil and gas products are one of the unique types of supply chains whose management requires special knowledge and expertise (Shuen, Feiler, & Teece, 2014). Indeed, this requires a high level of knowledge and expertise across the length and width of oil and gas supply chains which sometimes depends on the restrictions of international companies with well-known brands in this field. Implementing the principles and foundations of dynamism and promoting dynamic capabilities in this field can provide very desirable results in the growth of the industry of extraction, processing as well as production and distribution of petroleum products.

The dynamic capabilities approach stresses that gaining a competitive advantage is directly related to the output of the organization's management and organizational processes and is formed by the status of unique organizational assets in the form of dynamic capabilities and access paths (Teece et al., 1997; Scholten et al., 2019). Indeed, dynamic capabilities can be defined as the ability to perceive and shape opportunities and threats, maintain competitiveness through enhancing, integrating, protecting, and even reconfiguring tangible and intangible organizational assets. The review of recent research and study trends has shown that various researchers have developed the dynamic capability perspective, i.e., a resource-based perspective to examine the effects of dynamic markets on business systems within the organization (and consequently across supply chains) (Rasouli, Trienekens, Kusters, & Grefen, 2015). In this regard, the quality of human resources at the disposal of the organization, alternative capacities in value creation processes, the presence or absence of opportunities and environmental threats, strategic and integrated decision-making systems and the level of utilization of information systems to gain competitive advantage have been considered for the organization in the form of valuable resources (Pandit, Joshi, Sahay, & Gupta, 2018; Riviere, Suder, & Bass, 2018; Teece, 2018; Yeow, Soh, & Hansen, 2018; Sheel et al., 2019).

Strengthening organizational processes to enhance dynamic capabilities can be considered as one of the most critical factors to gain a competitive advantage for the organization and its related supply chain (Alsawafi et al., 2020). Thus, achieving a model involving the factors affecting the development of dynamic capability in the supply chain management of oil and gas products can be regarded as an information prerequisite for achieving some kind of optimization in decision-making processes to improve dynamic capability in the management of this chain. Accordingly, the purpose of this study was to present a model for dynamic capability improvement for Iran's oil and gas industry for achieving success in international markets. In this regard, research questions can be presented as follows:

1. What are the factors affecting the promotion and improvement of dynamic capabilities at the international market level in Iranian oil and gas industries?

2. How can the classification of dynamic capability improving factors in the field of international markets of Iranian oil and gas industry be presented?

3. What is the importance of the key components of dynamic capabilities model from the perspective of the competence – emergency matrix?

2.Theoretical Framework

2.1. Resource-Based View and Organizational Dynamic Capabilities

Teece et al. (1997) first introduced the concept of dynamic capabilities to explore the important role of capabilities in building, integrating, and reconfiguring resources to deal with highly changing environments. The changing industrial environment has changed the foundations of competition. As such, in situations including dynamic and rapidly changing environments, the dynamic capabilities approach describes the firm's competitiveness more effectively than the resource-based approach (Yini & Wu, 2014; Teece et al., 1997; Eisenhardt & Martin, 2000; Zahra et al., 2006; Lin & Wu, 2013). Dynamic capabilities theory has been proposed in response to the static nature of resource-

based theory, which emphasizes how companies differ in resource-based theory. On the other hand, dynamic capabilities emphasize the way through which companies are constantly configuring new resources and creating valuable resources in dynamic markets.

A key issue can be well examined by a resource-based perspective is the sustainability of competitive advantage (Scholten et al., 2019). As one of the main experts on resource-oriented attitude, Barney (1991) mentions four important characteristics for resources that can act as a competitive advantage in order to acquire and sustain dynamic capabilities in the organization. According to Masteika & Čepinskis (2015), these sources are quoted as follows:

A) Value of resources: Valuable resources are resources that can be used to take advantage of opportunities and neutralize environmental threats. According to the traditional analysis framework, an organization can improve its performance only when the strategies used provide the organization with the ability to take advantage of opportunities and deal with threats. Note that this is practically meaningless without valuable resources in the organization, i.e., resources that allow you to take advantage of opportunities and avoid threats. This is also true at the supply chain level.

B) Scarcity of resources: Resources must be scarce among current organizations and potential competitors. As mentioned earlier, an organization can only have a permanent competitive advantage when it has adopted a value-oriented strategy been used simultaneously by any of the potential and actual competitors, and this is only possible if there is a scarcity of resources.

C) Inimitability of resources: resources must not be completely imitable. Barney states that valuable and scarce resources can act as a source of competitive advantage, though what sustains this advantage is the inimitability of the advantage or the resources that created it. This leads to an increase in organizational capabilities over competitors in the business market.

D) Irreplaceability of resources: Strategically, there should not be the same substitutes for these resources. The substitutability can even be such that although it is not possible for a firm to imitate the resources of another firm accurately, it can replace resources that lead to the design and implementation of the same strategy.

According to Teece et al. (1997, 2007 and 2009), the dynamic capabilities in the organization can be achieved by gaining an advantage in terms of resources and capabilities at different levels of the organization and supply chain. Resources represent assets controlled by a firm that are widely discussed in the resource-based approach as an input to organizational processes. Capabilities focusing on the company's ability to integrate, develop, and use resources to create a competitive advantage (Kaleka, 2002). Hitt et al. (2001) define competitive advantage as when a firm implements a specific strategy competitor are unable to imitate or when imitation is too costly for competitors. When competitors fail to imitate this valuable strategy of the firm, the firm gains a competitive advantage. Resources are at the heart of the resource-based perspective. These organizational resources include all assets, organizational processes, organizational features, information, knowledge and other items under organizational control enabling it to develop and implement strategies to improve its efficiency and effectiveness (Sadri & Lees, 2001).

2.2. The Components of Dynamic Capabilities

The concept of dynamic capabilities refers to an organization's capacity to renew or update itself to achieve new forms of competitive advantage (Bernroider & Wong, 2014). Helfat et al (2007) consider dynamic capabilities as the capacity of an organization to create, expand, or improve its resources on a regular basis. The dynamic capabilities approach introduces three main components as sources of dynamic capabilities. These three components are integration, learning, and reconfiguration. If organizational resources are scarce despite creating added value for the organization and cannot be imitated or copied or easily purchasable, they can lead to sustainable competitive advantages in the organization (Lin & Wu, 2013). Most of these studies have referred to resources with such characteristics as "capability" or "capacity" (Makadok, 2001; Amit & Schoemaker, 1993; Froehlich, Bitencourt, & Bossle, 2017). In the book “Dynamic Capability and Strategic Management”, Teece (2009) examines and analyzes how dynamic capabilities can be improved on a large scale with an in-depth view. According to Teece (2009), if dynamic capabilities are examined from an analytical point of view, they can be classified and defined into the following components:

A) Identification of environmental opportunities and threats: In this approach, dynamic capabilities can be considered as those mechanisms and capabilities that enable the organization to consciously and continuously identify environmental opportunities and threats.

B) Taking advantage of opportunities in the environment: In this approach, dynamic capabilities can

be considered as the mechanisms, processes, and capabilities that enable the organization to consciously use environmental opportunities to maintain and create a competitive advantage.

C) Managing threats and maintaining a competitive position by changing the composition and reconfiguration of the organization's tangible and intangible assets: threat management refers to the mechanisms, processes, and capabilities that enable an organization to consciously and continuously control the threats to its benefits, while reconfiguration offers the ability to combine assets to enhance the organization's resilience and speed of response to environmental threats and movements.

The following studies on dynamic capacities and capabilities at organizational levels and supply chain management have mostly attempted to examine the different conditions of the environment and its relationship with the level of dynamic advantages. A company environment is "all the physical and social factors directly considered in the decision of individuals in the organization." This broad definition includes dimensions used in various research fields. Most researchers have classified environmental features as stability/dynamics, simplicity/complexity, and forgiveness/hostility (Buil-Fabregà, Alonso-Almeida, & Bagur-Femenías, 2017; Sheng, 2017). Mintzberg (1983) also presented four environmental dimensions known as stability versus dynamism, simplicity versus complexity, friendship versus hostility, and integrated markets versus discrete markets. Dynamics is interpreted as unpredictable, i.e., the rate of changes and innovations in an industry and the unpredictability plus uncertainty of measures and decisions made by customers. The performance and role of environment dynamics within the supply chain is almost the same (Gupta & Gupta, 2019). Nevertheless, the difference is that systems have become more complex, in response to which dynamic capabilities should become more complex and specialized in order to have a significant positive impact on the performance of companies within the chain and ultimately that of the chain itself (Mathivathanan, Govindan, & Haq, 2017).

When the business environment around the chain is relatively stable and does not have significant technical advances, or has little change to the demand of customers, strong dynamic capabilities are likely to be expensive or even destructive due to maintenance costs. Thus, the relationship between dynamic capabilities and competitive advantage may become weaker or even negative (Beske, Land, & Seuring, 2014). However, in a highly changing environment with fleeting opportunities and permanent threats from competitors, supply chain companies are forced to make frequent and complex changes and thus dynamic capabilities may play a more important role, while the environment can be very competitive and dynamic. D'Aveni et al. (2010) suggested that it is difficult to understand the necessary adjustments and implement changes in a timely manner in a highly competitive environment. Thus, the only way is to achieve a series of short-term benefits for companies and hence for the supply chain (Mathivathanan et al., 2017). However, in a harsh environment where resources are easy to access, companies can implement previous strategies and adjust resources freely to adapt to changing environments; as a result, relatively weak dynamic capabilities can achieve long-term competitive advantages (Gölgeci, Larimo, & Arslan, 2017). Experimental research has shown that in a relatively stable and non-competitive environment, also the relationship between dynamic capabilities and firm performance is negligible, and to achieve competitiveness, promoting operational capabilities is sufficient while gaining by using the advantages and capabilities of dynamic capabilities dynamics is not critical (Ringov, 2017). On the other hand, if environmental changes and their effects on the way through which the capabilities affect competitive advantage are also considered, the issue of dynamic capabilities is conceptualized as the organization's ability to integrate, create, and redesign internal and external competencies to respond to rapid environmental changes (Froehlich, Bitencourt, & Bossle, 2017). They also identify the dynamic capabilities as the organizational managers' efforts to change, integrate, and recreate the organization's internal and external skills, resources, and competencies required to interact with changing environments (Teece et al., 1997; Gupta & Gupta, 2019). Dynamic capability focuses on creating situations plus a specific set of new knowledge (Wang et al, 2007). Dynamic capability acts as an intermediary between the company's resources and the changing external environments. Dynamic capabilities allow the firm to re-integrate and renew its mix of resources, to create the capabilities required to compete in an ever-changing competitive landscape. This feature in rapidly changing environments is very important even though a competitive advantage is rapidly eroding and the company and market requirements are met simultaneously.

2.3. Importance of Dynamic Capabilities in Supply Chains

Although "supply chain management" and "dynamic capabilities" are two scientific paths with the expanding study literature, both of which being at the forefront of scientific studies in the field of management, at first glance it can be inferred that the relationship between these two is weak. As the possible reason, at first glance at the supply chain level, achieving objectives and demands in the form of dynamic capabilities may seem very difficult or even impossible (Defee and Fugate, 2010). Nevertheless, researchers claim that attention to dynamic capabilities in the management of supply chains that seek competitive advantage in dealing with uncertainty is a fundamental necessity and a key issue in the long-term survival of the chain. Wang & Ahmed (2007) in their study of the factors of acquisition of competitive advantages and dynamic capabilities at the organizational level recommended to maintain, strengthen and acquire them for the manufacturing companies. On the other hand, researchers believe that one of the production strategies to deal with uncertainty and to gain a competitive advantage is at the supply chain level and researchers such as Mathivathanan et al. (2017) have confirmed this issue; despite all this research, there has not been much discussion in domestic and foreign studies about the factors affecting the promotion of dynamic capabilities. If this is investigated by considering different environmental conditions and its effect on the performance and the impact of dynamic capabilities, it will be important to note that many facts have not yet been revealed to researchers in this field. Now, it seems that the importance and necessity of this study becomes more obvious by recognizing the factors affecting the promotion of dynamic capabilities in order to achieve a variety of dynamic capabilities in accordance with the chain environment and strategic requirements in supply chain management for gaining competitive advantages over competitors.

2.4. Recent Research of Dynamic Capabilities in the Petroleum Industry

Adefulu et al. (2020) implemented the fundamentals and measurers of dynamic capabilities theory to investigate the strategic marketing, innovation culture, and competitive advantage of petroleum industry in Nigeria. They believed that the adoption of dynamic capabilities theory is basically premised on its relative importance to how it enables firms to understand how they should integrate, build, and reconfigure internal and external competencies. Such understanding obtained in terms of strategies, resources, and capabilities to address rapidly changing and dynamic operation in ambiguous environments and a dynamic competitive environment must demonstrate regular usage of market knowledge, search for new market information, value-based decisions and seek innovative leadership by consistently gathering and using market intelligence Thus, the study recommended that the management of petroleum companies should be committed to adopting strategic marketing towards building innovation culture and achieving competitive advantage throw out from Dynamic capabilities philosophy.

The aim of the Sheel et al. (2020) is to examine the effect of marketing and supply chain orientation under environmental uncertainty on supply chain agility of downstream oil and gas supply chains in India. According to the results, gaining dynamic capabilities is important to both stable and high-velocity markets in petroleum supply chains and they mentioned some solutions to the lack of agility and consequently low dynamic capability in the downstream petroleum supply chain in India.

According to Shuen et al. (2014), promoting dynamic capabilities in the oil and gas industry can be considered as a super-process, requiring the coordination and leadership of a set of activities, resources, processes, and best practices to be used for comprehensive and regular management of strategic and structural issues in this field. Identifying and strengthening the factors affecting the development of dynamic capabilities can lead to empowerment and making accurate decisions about orientations, stakeholder coordination, readiness for change, increasing agility throughout the chain to better and more appropriate values and reduce risk.

The findings of Shuen et al. (2014) in the field for the oil and gas industry showed that the three dynamic capabilities: "(1) ambidexterity across mature and emerging domains; (2) the ability to manage the upstream business ecosystem; and (3) the ability to manage Health, Safety, Security and Environmental (HSSE)" are more important for the upstream companies of the oil and gas industry in the current turbulent environments. Existence of chain capabilities in both developed areas and emerging areas of knowledge, high business ecosystem management capabilities for upstream oil and gas industries and the management capabilities in the field of health and safety and environmental considerations in multinational corporations through business ecosystems are among the key issues as a dynamic component.

3. Research Method

The present research is an applied descriptive research in terms of the nature of the subject under study and the considered objective. The time period of the research was 2018-2019 and the spatial territory of data collection was Iran. The research process can be divided into three parts: 1) gathering the factors of dynamic capabilities promotion; 2) classifying and extracting key components and; 3) determining the priority of key components of dynamic capabilities promotion from the perspective of competence- emergency matrix.

The statistical population of the present study consists of all middle and senior managers (with at least 5 years of managerial experience) in the field of oil and gas project management at operational levels in the upstream (extraction and refining) and downstream (distribution and maintenance network). The others include senior specialists in the ranks and staff of the National Iranian Oil Company and the National Iranian Gas Company and affiliated organizations with at least 20 years of experience. According to the official staff statistics, the total number of the population was estimated at 11300 and according to Morgan's table, the statistical sample was 374 people. Statistical sample members were randomly selected from the personnel code of employees and randomly selected. Questionnaires were distributed in coordination with company officials and via email as well as letter. However, as a percentage of the questionnaires may have not been returned to the researchers, a total of 400 questionnaires were distributed. Finally, 381 questionnaires containing valid answers were received by researchers and used in statistical analysis. Also, for competence-emergency analysis, 30 top managers of the organization were selected from the research community, based on their formal records of managerial posts and experiences about strategic management in the petroleum industry.

3.1. Evaluating Validity and Reliability of Data Collection tools

In this research, two kinds of questionnaire were implemented for data collection. All of the data collection tools were prepared and adjusted in the form of 24 items extracted from the summary of the related study literature review (which has been given in the form of the items in Table 1). The questionnaire No.1 was established based on, a spectrum of 5 scale Likert options (5=extremely important, 4=very important, 3=important, 2=somewhat important, 1=not important) to evaluate and adapt the mentioned 24 items extracted from study literature review to Iran's petroleum industry with these scales used to conduct factor analysis. The validity and reliability of the questionnaire No.1 were examined before the final data collection. Indeed, the validity of the questionnaire was investigated using the content validity method and its reliability was examined using two methods of representation and examining the internal consistency of the items. In order to evaluate the validity, the questionnaire was provided to 6 university professors, while to examine the reliability, first the designed questionnaire was distributed among 10 members of the statistical community at two different times with a two-week interval. After data collection, Spearman correlation coefficient index of r = 0.877 was obtained. This indicates an acceptable level of reliability of the research questionnaire. In addition, Cronbach's alpha coefficient values were calculated after collecting, analyzing and classifying the data derived from the heuristic factor analysis test. The results revealed that Cronbach's alpha coefficients for all categories were greater than 0.7 suggesting the existence of internal consistency between variables in all research structures. Finally, the questionnaire No.1 was distributed across the statistical sample after reviewing and confirming the validity and reliability.

The questionnaire No.2 was established to classify the components extracted from EFA results (questionnaire No.1) in terms of their importance. Accordingly, the importance of the extracted components from EFA results was analyzed in terms of two indicators: competency and emergency. Specifically, the questionnaire No.2 was established to evaluate the main factors extracted from previous stage by a score between 1 (minimum value) to 9 (maximum value). The validity of the questionnaire No.2 was examined using content validity method. In addition, its reliability was examined before final data collection via test-retest method and distributing among all 30 top managers at two different times with a one-week interval. After data collection, Spearman correlation coefficient index of r = 0.756 was obtained from comparing the results of questionnaire No.2. This correlation is proved the reliability of questionnaire; thus, it was distributed for the last time among the mentioned experts.

4. Findings

As the aim of the present study was to identify and extract the factors as well as dimensions affecting the promotion of dynamic capabilities in the supply chain

management of oil and gas products, first, the factors affecting the promotion of dynamic capabilities were initially identified by reviewing and summarizing the research literature in the form of 24 items with the main factors extracted from them by exploratory factor analysis (EFA). Then, the main factors were classified into four main categories based on the competence-emergency matrix method. In the following, the procedure and the findings are described.

4.1. Results of EFA Method

In order to achieve the main dimensions and classification of the identified primary factors, the statistical approach of exploratory factor analysis (EFA) was used. After collecting data by questionnaire No.1, the data were fed into SPSS 24 statistical analysis software. Table 1 presents the titles extracted from the research literature and the output of the classifications obtained from the exploratory factor analysis as well as the values of the factor loadings extracted based on the Varimax algorithm in 6 rounds. The titles of each component have been selected based on the relevant literature and the maximum amount of factor loading in each category.

Table 1. Factors affecting the promotion of dynamic capabilities and classifications obtained from the exploratory factor analysis test.

Dimensions	indicators	Extracted Communalities	Rotated Factor Loads	Cronbach's Alpha
(D1) Strategic conducting of capital resources	Making appropriate and effective investments in research and development	0.907	0.984	0.854
	Making appropriate and continuous investments in order to find solutions to meet customer needs	0.857	0.968	
	Adequate knowledge of the trend of changes in supply and demand and solutions to provide a quick response to them	0.917	0.834	
	Applying best practices and strategies to achieve production and service goals throughout the chain	0.84	0.738	
	Observing a reasonable level of risk in investments and, investing in projects that are more likely and realistic for market acceptance	0.897	0.717	
(D2) Effective knowledge management	Recording, categorizing and integrating historical and experimental methods in relation to organizational and specialized issues in the form of a coherent knowledge management system	0.897	0.955	0.836
	Continuous collection of customer information to identify potential markets inside and outside the business environment	0.917	0.982	
	Utilization of appropriate and effective communication and technological infrastructures in service and production processes	0.969	0.987	
	Use of industrial information collected by specialized organizations outside the chain to make managerial decisions	0.876	0.883	
(D3) Compatible organizing	Existence of a deep understanding of the laws governing the domestic and international business environment	0.747	0.976	0.794
	Existence of clear and specific procedures in the reallocation of human resources in the case of need for reconfiguration	0.889	0.953	
	Ability to change resources along the chain in order to provide a rapid response to environmental changes through efficient and effective communication with domestic and foreign business partners	0.892	0.902	
	Timely compensation of possible mistakes and errors by one of the components of the chain by the other members	0.898	0.99	0.757

Dimensions	indicators	Extracted Communalities	Rotated Factor Loads	Cronbach's Alpha
(D4) progressive partnership and collaboration	Communicating frequently with competitors, customers, suppliers, etc. to gather useful information in a timely manner	0.872	0.912	
	Existence of incentive systems for the exchange of knowledge, experience and expertise between employees throughout the production chain and supply chain	0.941	0.832	
(D5) Emphasis on improving human resource capabilities	Existence of ongoing activities to increase the empowerment between employees and managers throughout the chain	0.937	0.903	0.835
	Allocation of proportional resources to grow the capabilities of employees within the chain	0.845	0.895	
	Continuous ability to create and absorb new knowledge, to develop new products or processes	0.731	0.821	
(D6) Facilitating factors of external controls	Ability to respond quickly to environmental changes in terms of demand throughout the supply chain	0.963	0.978	0.791
	Existence of efficient systems to hear the voice of target customers and make changes based on customer feedback	0.988	0.921	
	Ease of access to specialized and experienced human resources	0.761	0.904	
(D7) Commitment to promoting competitiveness in the business environment	Adaptation of vision and organizational mission in order to promote competitiveness in the business environment	0.947	0.869	0.812
	Utilization of specialized analysis tools of market and competitive environment by the management and employees of the company	0.897	0.834	
	Directing and integrating industrial technologies to develop new products throughout the chain	0.757	0.805	

When performing the statistical test of factor loading, it must be ensured whether the number of data required is suitable for performing factor analysis or not. For this purpose, KMO index and Bartlett test are used. The value of KMO index should be at least 0.5 and the significance level of Bartlett test should be less than 0.05 and the relevant factor loading should be higher than 0.5. The results of this analysis for the items of the research questionnaire have been given in Table 2.

Table 2. Results of KMO and Bartlett test in determining dimensions.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.83
Bartlett's Test of Sphericity	Approx. Chi-Square	837.139
	df	820
	Sig.	0.000

The data in Table 2 show the value of the KMO index, the Bartlett test statistic, the degree of freedom, and the level of significance. Since the KMO index value has been estimated at 0.83 (greater than 0.5), the number of samples is sufficient for the factor analysis. In addition, the significance level (sig) of Bartlett test is less than 5%; thus, it shows that factor analysis is appropriate to identify the structure of the factor model, where the assumption that the correlation matrix is known is rejected.

The Final statistics in rotated component matrix using Varimax rotation method are presented in Table 3. Small quadrangles in this table explain five final components (or factors) based on their factor loadings. According to Hu & Bentler (1999), any value larger than 0.6 is considered acceptable. Since the values of factor loading for the initial component of 'Integrating process' and ' technological cooperation' are smaller than the acceptable value, we have excluded this component from our further analyses.

Table 3. Total variance explained using principal component analysis.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.651	21.1	21.1	8.651	21.100	21.100	8.113	19.787	19.787
2	7.247	17.675	38.775	7.247	17.675	38.775	5.742	14.005	33.792
3	5.75	14.025	52.8	5.750	14.025	52.800	5.515	13.452	47.243
4	5.535	13.5	66.3	5.535	13.500	66.300	4.856	11.844	59.087
5	3.801	9.271	75.571	3.801	9.271	75.571	4.855	11.841	70.928
6	3.387	8.261	83.832	3.387	8.261	83.832	3.852	9.395	80.323
7	2.383	5.813	89.645	2.383	5.813	89.645	3.822	9.322	89.645
8	0.858	3.092	91.737						
9	0.529	1.291	93.028						
10	0.325	0.792	93.82						
11	0.31	0.757	94.576						
12	0.261	0.636	95.212						
13	0.247	0.601	95.813						
14	0.179	0.827	96.249						
15	0.17	0.414	96.664						
16	0.139	0.34	97.003						
17	0.131	0.32	97.324						
18	0.108	0.263	97.587						
19	0.104	0.253	97.84						
20	0.089	0.216	98.557						
21	0.077	0.189	99.024						
22	0.069	0.168	99.413						
23	0.062	0.15	99.563						
24	0.04	0.046	100						

4.2. Results Related to the Competence-Emergency Matrix Analysis

To obtain the importance of the components extracted from EFA results, the data collected using questionnaire No.2 were analyzed in terms of two indicators: competency and emergency. To do this, 30 top managers of the organization were asked to assign a score between 1 and 9 for each of the seven identified components of the strategies affecting the promotion of dynamic capabilities from two perspectives of competence (relevance) and emergency, while taking into account the state of the industry and competitive conditions in the environment. The mean scores extracted from the data collected using questionnaire No.2 and the related classification are visualized in Figure 1.

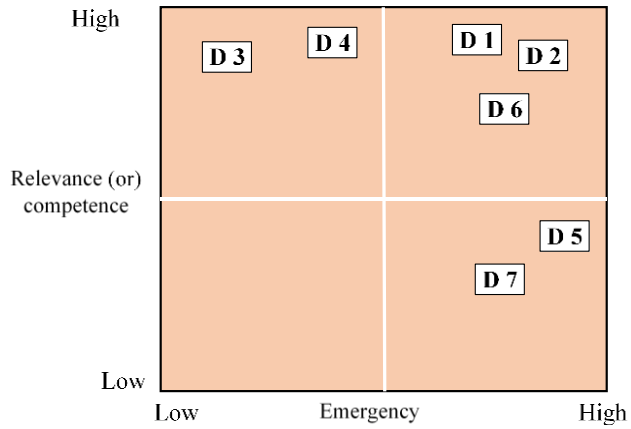

Figure 1. Competence-emergency matrix of development strategies of dynamic capabilities for Iran's oil and gas industry.

The competence-emergency matrix defines four types of ASC units (Fig. 3) with the analyses of each area being as follows:

1- High competence and high emergency: the organization often needs heavy investment and should pay more attention to designated activities as they involve suitable opportunities for enhancing dynamic capabilities of organization in future. According to the dimensions list of dynamic capability development strategies for Iran's oil and gas industry on the competence - emergency matrix is shown in Fig. 3. The findings indicate that strategic conducting of capital resources (D1), effective knowledge management (D2) and facilitating factors of external controls (D6) lie in the scope of high relevance/ competence and high emergency of the matrix.

2- High competence and low emergency: These activities need much investment and require more considerations, but it can be distributed for some periods. Compatible organization (D3) and progressive partnership as well as collaboration (D4) fell in the group of high relevance and low emergency.

3- Low competence and high emergency: in this area, for enhancing dynamic capabilities of organization, innovative markets are required where there is a volatile and unpredictable demand for short life cycle. Emphasis on improving human resource capabilities (D5) and Commitment to promoting competitiveness in the business environment (D7) were classified in the scope of a low relevance and high emergency depending on the investment flow, interest and size of the company.

4- Low level competence and emergency: These activities need elimination. None of the dynamic capabilities enhancement activities has been designated in this area.

5. Conclusion

Upgrading dynamic capabilities in oil and gas industry supply chains can be considered as a super-process requiring coordination and leadership of a set of

activities, resources, processes and best practices. It is used for comprehensive and systematic management of strategic and structural issues towards development and growth. In this study, the model of factors affecting the enhancement of dynamic management capacities in the supply chain of oil and gas products in seven main categories has been collected as follows: strategic management of capital resources in order to promote dynamic capabilities, effective knowledge management throughout the chain, organization in line with dynamic capabilities development, dynamic partnership and cooperation between components, emphasis on promotion of human resource capabilities, facilitators of environmental control, commitment to promoting the competitiveness in business environment. According to the factors and dimensions extracted from the research literature, also and the formation of the dynamic capabilities factor model, as well as the findings of the examination of the model validity, can be considered as follow-up and strengthening and the strategic and executive items in this chain in order to upgrade dynamic capabilities and considered the research model as a basis for action and an efficient tool for maintaining dynamic capabilities in the oil and gas supply chain and its elements in the form of oil companies in Iran. According to the findings, it was found that "strategic direction of capital resources to improve dynamic capabilities" with 32% of explanatory power was the most important factor affecting the promotion of dynamic capabilities in the supply chain management of oil and gas products. This is in line with some research findings such as Hong et al., (2018) as well as Masteika & Čepinskis (2015). Note that the indicators and components presented are more comprehensive and complete than the similar cases of supply chain dynamic capability assessment presented in previous studies. Because the specific indicators for different components in different processes, have been discussed in detail, and have been approved in the Iranian oil industry. In addition, the data evaluation and analysis approach has made it possible for research structures to be generated and modeled in the form of categorized factors.

It seems that by strengthening and promoting the dynamic capabilities in supply chain management using the proposed components and indicators, the country's oil and gas companies can take basic steps in the form of a supply and distribution chain to enhance competitiveness in international markets, customer satisfaction, and timely operation of projects, reduction of lost costs and speed of operation.

Finally, the establishment of a research model to promote the dynamic capability of supply chain management in the oil and gas industry in national oil companies and other related companies in the form of supply chain with the support and assistance of senior management and relevant officials can be considered as the most important research proposal. In this regard, training people and culture-building in order to improve the company's dynamic capabilities, eliminate weaknesses in the field of dynamic capability, determine the responsibilities of each department and individuals in order to improve the dynamic capabilities and design an appropriate incentive and punishment system to pave the way for modeling Supply chain dynamics in the National Iranian Oil Company could have a significant effect on improving the supply chain management capabilities of the oil and gas industry in terms of dynamics.

It seems that by strengthening and promoting dynamic capabilities in supply chain management using the components and indicators presented in the present study, the country's oil and gas companies can take huge steps towards customer satisfaction, timely operation of projects, reduction of lost costs, speed of action, and improve competitive performance in the form of a supply and distribution chain. The most important executive and research suggestions related to the present research can be presented as follows: establishing the model in national oil companies and other related companies in the form of supply chain with the support and assistance of senior management and relevant officials; Educating people and creating a culture to promote dynamic capabilities in the supply chain in the National Iranian Oil Company; eliminating the weaknesses in the field of supply chain dynamic capabilities in the oil and gas supply chains and the National Iranian Oil Company as well as strengthening the strengths of the supply chain's strongness within a specific schedule; determining the responsibility of each of the organizations and individuals involved in the supply chain of the National Iranian Oil Company in connection with the promotion of dynamic capabilities; designing an appropriate incentive and punishment system to pave the way for the establishing a supply chain dynamic capability model in the National Iranian Oil Company.

In a summary of the presented cases, the theory of dynamic capabilities states that the promotion of competitive performance has a direct relationship with how to obtain output from the management and organizational processes of the organization; it is formed by the status of unique organizational assets in the form of dynamic capabilities (Teece et al, 1997; Teece, 2009).

In other words, dynamic capability can be defined as the ability to perceive and shape opportunities and threats as well as to maintain competitiveness, through the enhancement, integration, protection, and even reconfiguration of tangible and intangible organizational assets. Examining recent research and study trends shows that different researchers view dynamic capabilities differently. That is, they have developed a resource-based approach to examining the effects of dynamic markets on business systems within the organization (and consequently across supply chains) (Rasouli et al., 2015). In this regard, the quality of human resources at the disposal of the organization, alternative capacities in value creation processes, the presence or absence of opportunities and environmental threats, strategic and integrated decision-making systems, and the level of utilization of information systems in order to gain value in terms of competitiveness have been considered (Riviere et al, 2018; Teece, 2018; Pandit et al, 2018; Yeow et al., 2018).

Furthermore, for future research, we propose to identify more activities and indices associated with development strategies for Iran's oil and gas industry and to use them for better decision-making in the field of dynamic capabilities and achieving more efficient agile supply chain. In addition, the methodology of this study can be used in other industries.

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