

Evaluating Agility Components in the Supply Chain Processes of Fisheries Industry

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Abstract – In different cities of Hormozgan Province, there are several sea product production and distribution units. In recent years, however, most of them have been inactive, or have occasionally been active throughout a year, due to many problems. The main problem is the lack of agility or an agile supply chain which can be adopted with environmental changes and continue as a competitive unit. The aim of this study is to analyze the hurdles in the way of promoting agility in the supply chain of fisheries industry, especially in Bandarabbas and in tuna fish producing companies. This study will assist managers and authorities in identifying the problems and challenges of the improvement of agility and designing an accurate plan to tackle the problems. The relevant sample size consists of all people with sufficient knowledge about agility, supply chain and relevant organizational issues, human resource, production line processes and information technology. The data of the theoretical part of study was collected using documentary research, desk method and Farsi and English papers available in reputable websites. In addition, filed data was collected using questionnaire and interview. The questionnaire was designed based on the literature of study and attempts were done to include the important achievements of supply chain agility. The components of agility in different parts of supply chain were inquired by the general structure of the questionnaire. Each component was measured using a series of indices and each index was assessed by an item. The status of different components of agility in the different parts of the studied organization supply chain was first assessed using the collected data. The indices, then, were ranked using TOPSIS technique. In the next step, pairwise comparisons were conducted on indices using experts' opinion. The indices and components, then, were ranked using the obtained importance factor as well as the mean opinion of population in order to identify the weakness and strength of the organization. According to results, the supply chain of fisheries industry has an acceptable level in the component of responsiveness and has a moderate level in the components of competency, flexibility and quickness. Regarding importance factors, the maximum importance factors were derived for competency, flexibility, quickness and responsiveness components, respectively. The results indicate the moderate level of the supply chain of fisheries industry. It can be argued, therefore, that the indices of these components should be investigated in order to promote agility and in turn to improve the organization. In addition, current weaknesses as well as the indices in which organizations show weak performance should be identified using proper approaches in order to aid the organization to achieve higher agility. Since competency and flexibility are more important than quickness and responsiveness, organizations should concentrate on them in order to achieve higher agility. Generally, organizational processes are being ranked as follows based on agility components: employees, manufacturing processes and products, technology and organization. Organization is more important and even is as important as other components. However, it was less agile in the studied supply chain. Thus, the maximum emphasis should be put on this filed in order to promote agility.

Keywords – Agility, Agile Organization, Agile Supply Chain, Supply Chain.

I. INTRODUCTION

Both organizations and people have experienced many changes in recent century. The root of the changes might have been grown from several years ago. The inclusion of IT in every field, the necessity of being agile and responding customers, the ever-increasing changes of markets and consumers' needs and the necessity of being more flexible in organization and production sector are a shift towards the concept of organizational agility [Kaid, 1994; Goldman, 1995; Naylor, 1999; Ramesh, 2007]. From early 1990s, the paradigm of production agility has been put forward as a solution for managing environmental changes and dynamism [Sherihai, 2007] and as a strategy for empowering production institutions and organizations in order to protect competitive advantage in a turbulent environment. Manufacturing organizations have welcomed this solution [Hooper, 1998]. Innovative production links ITC to the fundamental re-design of organizations as well as new marketing strategies [Gunasekaran, 1998]. Agile production is a new production model originated from environmental changes [Goldman, 1995; Sharifi, 2000; Yousef, 1999]. Production agility associates with the ability of a corporate in surviving and being successful in a competitive environment with continuous and unpredictable changes [Sarx, 1999].

Geographically, Hormozgan shares coastlines with high seas. As the only Province of Iran sharing a maritime border with Oman Sea and Persian Gulf it is a very potent and capable province in terms of producing and distributing sea products in Iran so that several units produce and distribute sea products in different cities of the Province. In recent years, however, most of them have been inactive, or have occasionally been active throughout a year, due to many problems. The main problem is the lack of agility or an agile supply chain which can be adopted with environmental changes and continue as a competitive unit. This study tries to investigate the influential components of supply chain agility based on reference models, to use the components to measure organizational agility and to identify current hurdles in the way of organizational agility. Moreover, it enables us to recognize indices making the organization agile and to give the competition power to the organization in current turbulent market. Those units that have suspended their production, or produce occasionally, due to the lack of agility can use these indices to create an agile supply chain, continue their activity and obtain a considerable market share. The main aim of this study is to evaluate the components of agility and to determine the

extent of agility in the supply chain processes of Hormozgan Fisheries Industry as well as in tuna fish factories of Bandarabbas.

II. METHOD OF STUDY

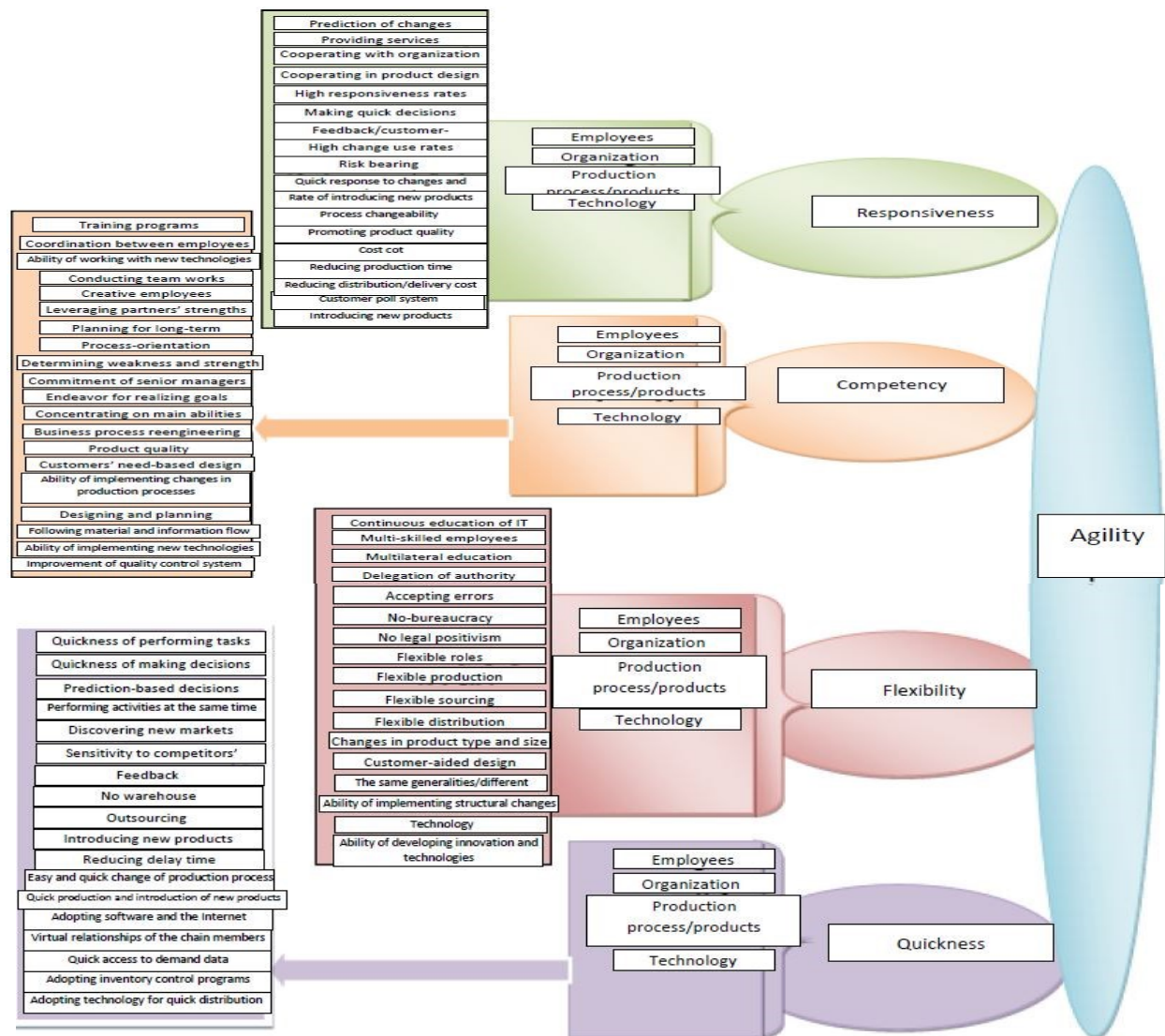
Design of Study and Participants

This is an applied study in terms of objective. It combines quantitative methods (survey) and qualitative methods (observation and interview) depending on the stages and objective of study. The sample size of study is the production units of Bandarabbas Fisheries Industry. Field

data was collected using questionnaire and interview. The questionnaire items were evaluated by Likert scale with multiple options. It was designed based on the literature of study and attempts were done to include important achievements in the field of agility. The components of agility in different parts of supply chain were inquired by the general structure of the questionnaire using Likert 7-point scale.

The Conceptual Model of Study

Considering the literature of study and stated models, the conceptual model and core indices of this study were derived as follows:



Data Analysis

Data was collected by questionnaire and Inferential and descriptive analyses were conducted by SPSS. In descriptive and inferential statistics, central and dispersion measures, including percent, cumulative percent, mean, standard deviation and frequency tables were used to classify cases in terms of different features, to describe population and to rank and compare indices. The aim of inferential statistics was to evaluate the relationships between indices and to examine the hypotheses of study. In

this step, the status of the studied organization in the different dimensions of agility was first evaluated using collected data. Then, they were ranked using TOPSIS. In the next step, the indices were compared with each other using experts' opinions and pairwise comparison table. The indices and components were then ranked based on the obtained importance factors as well as the mean opinion of the population in order to determine the weakness and strength of the organization in the components.

III. DISCUSSION AND RESULTS

Results

To evaluate demographic information, the first three items of the questionnaire were about education level, age and record. The majority of cases had B.S. degree (64%) and 20% and 16% of cases had M.S and over diploma degrees, respectively. Regarding record, the majority of cases had 4 to 6 years record (37%) while the record of 29%, 17% and 17% of cases was 7 to 9 years, 1 to 3 years and >10 years, respectively. These figures show only their record in fisheries industry and they may have additional records and experience in other organizations. When the final scores were determined, the agility of the supply chain processes of fisheries industry was estimated using ISDM relation. The obtained scores were converted to four agility levels as follows [Sadighi and Mohammadzade, 2003]:

A = Weak: the minimum $\leq A <$ mean - std.

B = Moderate: mean-std $\leq B <$ mean.

C = Good: mean $\leq C <$ mean + std.

D = Excellent: mean + std $\leq D \leq$ the maximum.

The Responsiveness of the Supply Chain Processes of Fisheries Industry

According to above table, 53% of the processes have a “good” to “excellent” level in the component of responsiveness while 47% have moderate and weak levels. The mean and standard deviation of the responsiveness of the processes are 5.07 and 0.33444, respectively. The results indicate that the responsiveness of the processes was estimated to be good.

The Competency of the Supply Chain Processes of Fisheries Industry

According to above table, 45%, 10% and 45% of the processes have a “good”, “excellent” and “moderate to weak” level, respectively, in the component of competency. The mean and standard deviation of the competency of the processes are 4.98 and 0.2881, respectively. The results indicate that the competency of the processes was estimated to be moderate.

The Flexibility of the Supply Chain Processes of Fisheries Industry

According to above table, 62% of the processes have a “good to excellent” level in the component of flexibility while 38% have “moderate and weak” levels. The mean and standard deviation of the flexibility of the processes are 4.97 and 0.35329, respectively. The results indicate that the flexibility of the processes was estimated to be moderate.

The Quickness of the Supply Chain Processes of Fisheries Industry

According to above table, 48%, 9% and 43% of the processes have a “good”, “excellent” and “moderate to weak” level, respectively, in the component of quickness. The mean and standard deviation of the quickness of the processes are 4.97 and 0.26837, respectively. The results indicate that the quickness of the processes was estimated to be moderate.

The Agility of the Supply Chain Processes of Fisheries Industry

According to above table, 4%, 94%, 46% and 7% of the

processes have a “weak”, “moderate”, “good” and “excellent” level, respectively, in agility. The mean and standard deviation of the agility of the processes are 5.002 and 0.2245, respectively. The results indicate the moderate to good level of agility in the organization.

Table 4-19. The distribution of frequency of the supply chain processes of fisheries industry in terms of agility

agility	frequency			Mean	STD
	Frequency	percent	Cumulative percent		
weak	4	4	4		
moderate	43	43	47		
good	46	46	93		
excellent	7	7	100		
Total	100	100	-	5.0023	0.22452*

Source: study results* Max. Mean of 7

According to above table, employees rank the first in terms of agility with better status than other indices followed by production process, organization and technology.

In response to the hypothesis of this study, it can be argued that since the indices of agility for the studied supply chain have been extracted from the literature of study, it includes several sub-hypotheses. The sub-hypotheses are explained in the following. The components of agility were considered as four main fields: responsiveness, competency, flexibility and quickness. Therefore, agility is defined as the ability of overcoming unexpected challenges, responding to unpredictable or unexpected changes in a proportional manner and at a proper time and the capturing the changes and converting them to opportunities. To this end, the supply chain processes were divided into human resource, organization, production process and products and organizational technology sub-components and the sub-hypotheses of study were derived from these sub-components.

IV. CONCLUSION

Almost all studies on supply chain have considered it as an integrated component and determined some factors for its agility. Therefore, it is possible to decompose it and evaluate the agility of each sub-component. Future studies are recommended to concentrate on this subject.

V. LIMITATIONS

Disaffiliation of cases and the lack of their disinterest to responding the questionnaire or participating in interviews, the broad literature of the study, multiple models, no access to universities and desk sources, and time restrictions were the most important limitations of this study.

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