Structural Changes for Attaining Business Framework Focusing on Technology Development (Case Study of East Azarbaijan Province Gas Company)

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ABSTRACT

The present study in line with the research priorities, on East Azarbaijan Province Gas Company, titled structural changes for attaining business focusing on information technology development, tries to predict the organization’s required changes and present a desirable organizational structure. In this research, structure as one of the organization’s components and according to Robbins classification is composed of 3 parts: complexity, formalization and centralization. Population of the research includes 10 university professors in the field of management who have sufficient knowledge about Gas Company’s structure as well as 60 managers of provincial gas company and structural design engineering managers of national gas company headquarters. They answered the native questionnaire of organizational structure in the present and desirable situation focusing on technology development. Stability of the questionnaire was 0.902. Results analysis of single sample t-test and average indicators show that East Azarbaijan Province Gas Company, in the present situation with regard to the organizational structure in order to attain business focusing on technology development, is higher than moderate in complexity, formalization and centralization aspects but comparing the present situation with desirable situation organizational structure it was specified that there is a gap between present and desirable situation and therefore, in developing new organizational pattern for national Gas Company in order to attain business focusing on technology development and regarding increase in job titles and more specialized tasks, the complexity indicator has to increase but formality and centralization indicators have to decrease with respect to the present situation.

INTRODUCTION

Today’s organizations encounter numerous changes in their business environment e.g., changes inside/outside organizational aspects and components. Organizations face continuous changes in strategies, information technology domain, hardware… changes in economy and organization governance rules, social changes and changes in sex, age combination of the society. They also encounter challenges like competitiveness; economic theories appearing in organization, knowledge workers, and there are various components in an organization which assist organizations and management in proper encountering changes and challenges of which we can refer to organizational structure. Literature and theoretical bases show that by appropriate structure designing it’s possible to proceed in efficient governance of the organization. Burns and Stalker believe that the most efficient structure is the one which adapt itself with environment requirements, i.e. a machine design is used in a stable and reliable environment and organizational structure is used in an agitated environment with lots of changes. Therefore, they specified that machine and organic structures are the ideal forms of organizational structures that are two ends of a continuum. No organization has pure machine structure, but in general every organization progress in the direction of one of these two structures. In addition, Burns and Stalker emphasize that none of these structures have advantage over the other. The nature of the organization environment determines which structure to be used [9].

Organizational structure is a continuous process of environmental changes, strategy and inter-organizational factors that change unavoidably by time passing [3]. Undoubtedly, the present era is the era of
organizations and founders of them who are human beings and capable to cause excellence, progress and growth of organizations for the reason that they possess the greatest power source i.e. thinking [6]. In organization theory, the size of an organization is an important variable that affects its structure designing. Results of researches show that regarding structural features of bureaucrat organizations, there are many differences between small and large organizations; for instance: formalization, centralization, complexity and staff relations employees [2].

Significance of the study:

Studies showed that the main problems in the way of performance and effectiveness in a country's organizations are the structural problems, since the organizational structures are often outdated and are based on traditional assumptions that are not compatible with the present work force and duties. They haven't considered mobility and changes of outer environment and are not established in accordance with the present society's requirements; also they took no notice of motivation and human dimensions. From the view point of Robbins, creativity is a prerequisite for innovation and innovation and modernistic realization depend on creativity and without creativity, innovation is not possible. Poor and inappropriate structure can deviate the organization from its strategic objectives, create conflict among the employees, prevent efficient decision-making, increase bureaucracy costs and spread personal problems.

In other words, if the three parts of the organizational structure i.e. complexity, formalization and centralization are merged together; organizational structure is created [5]. Organizational structure is the framework that defines the formal borders of the organization and it is the main guide for efficient and appropriate performance of employees and total organization' success. Organizational structure is a continuous process of changes of environment, strategies and inter-organizational factors which unavoidably change by time passing [3]. In other words organizational structure is a reflection of organization's objectives, size and complexity of professions, nature of proficiency utilized; required style for supervision and management, and control and coordination tools.

1. Research aims:

East Azarbaijan Province Gas Company has faced two major challenges during past years: first, during these years information technology appeared in most procedure of the company and this is a challenge which requires behavioral changes and a different structure to proper management of changes. Second, during these years most of the government organizations e.g. East Azarbaijan Province Gas Company was influenced by economic theories and experienced the appearance of theoretical bases in this area to the organization, regarding that the company's management was asked to manage the organization in a business framework and to pay attention to the sources and costs. The present study with a research priority in Gas Company, about structural changes based on business and focused on information technology tries to predict changes and present a desirable organizational structure. Therefore, the present research tries to answer three main questions about organizational structure of East Azarbaijan Province Gas Company in order to achieve business with focus on technology development:

1) How is the state of the desirable situation of organizational structure of East Azarbaijan Province Gas Company in the business framework focusing on technology development?
2) How is the present situation of organizational structure of East Azarbaijan Province Gas Company?
3) What are the solutions for the required structural changes in East Azarbaijan Province Gas Company focusing on technology development?

2. Conceptual definition of variables:

Organizational structure and organization's structure aspects:

Organizational structure clarifies how to allocate duties, who reports to whom, and which formal coordination mechanisms and which interaction patterns of the organization have to be followed. Organizational structure is a framework that defines the formal borders of the organization and is the main guide for efficient and proper performance of the employees and total organization's success.

In addition, structure is the indicator of the people who are responsible for supervision and it introduces the managers to the staff who have to receive orders from them. Of other applications of the structure for the organizations is assistance to facilitate the flow of information.

In this research structure as one of organization's components and with regard to the Robbins classification (composed of 3 parts: complexity, formalization and centralization) is defined. Complexity shows inter-organization separation limits. Also, it implies the rate of specialization, division of labor, and the number of levels in hierarchy of the organization and explains constraints that organization units are geographically distributed. Complexity is assessed considering 3 aspects: vertical separation (depth or height of organizational structure), horizontal separation (number of sub-units of the organization and special proficiencies) and geographical distribution. Formalization explains the organization reliance on rules, requirements, and
procedures in order to orient the staff's behavior [4]. The more trust the managers have on their subordinates in accepting them as efficient workers, the more the devolution to the subordinates will be and finally lack of centralization in the organization. Utilizing the requirements and procedures causes individuals not to act on their own taste and centralization refers to the point where decision making is centralized there.

**Complexity:**

Complexity is the rate of separation that exists in an organization and is measured on the basis of rate of specialization of jobs in the organization. In addition, it may be defined and measured by the number of places where work is done there, by the number of jobs and hierarchy that exists. Increase of complexity in an organization leads to the increase of control and coordination problems. The purpose of complexity is the number of duties carried out in the organization or the number of subsystems that exist there [9].

**Formalization:**

The second part of the organizational structure is formalization. It indicates the rate that different requirements, rules, procedures and communicational ways are written. The importance of formalization as one of the components of organizational structure is up to the extent that some authors considered organizational structure as the organization's framework, requirements, control instruments and work procedure. The higher rate of formalization eliminates ambiguity but on the other hand it deprives the employees from their right of decision-making and exercise of personal opinions. Organizations are different from each other regarding the degree of formalization the maximum formalization differentiates from minimum formalization. Formalization is Maximum when the formal procedures are many and work procedures are exactly specified by lots of rules and requirements [8].

**Centralization:**

Centralization implies the rate of organization's strictness in decision-making and assessments of activities in a centralized manner. Centralization determines the individuals who have right to decide in the organization. In a centralized organization, senior managers and those in top of the organization pyramid have the right to decide. In not centralized organizations decisions are made in lower levels Centralization implies the rate of centralizing decision-making in one point in the organization. Authority concentration at one point indicates centralization and lack of concentration is the sign of non-centralization.

3. **Review of the related literature:**

Burns and Stalker [1] are two researchers who represented two patterns of an organization which were two ends of one continuum. "Mechanical" structure was one of these patterns which has a lot of similarities with Weber idealistic organization (bureaucrat) and the "organic" structure of these patterns is in counterpoint of this structure.

Hage has counted the organizational structure features and implied that in different organizations the rate and the number of these features are very different; so he took a long step in the process of organizational check. The purpose of complexity is the number of duties or sub-systems that are done or exist in the organization.

In their studies Ackerman and Vanderhort indicated that information technology has relationship with lack of centralization, less formalization and more separation, and they stated that information technology enhances the managers' capabilities in handling organization's complexity and provides quick and coherent feedbacks in relation with performance thus facilitating delegation to lower levels. In a study Chang indicated that amount of information technology utilization relates directly to the team performance interaction; when the organizational structure is non-centralized and the formalization is very low, then interaction among team performance is much desirable. White and Waister believe that information technology affects mostly middle management. While empowerment and its relevant factors lead to lack of centralization in the organizations, information technology and management systems development tenhances the possibility of centralized control maintenance Procedures in technology that we call it "waves", have affected mainly our business. Companies and individuals capable of identifying and obtaining "waves" can achieve its competitive advantage [7].

In organizational strategies codification phase three factors have to be taken into consideration: organizational mission, inter-organizational factors and out-organizational factors.

**MATERIALS AND METHODS**

In terms of target, the present study is an applied research and in terms of nature and methods of obtaining the required data, it is a descriptive co relational research.

Population of this research is a number of university professors in management who have sufficient knowledge about the structure of Gas Company and they answered the questionnaire of desirable situation of organizational structure focusing on technology development and some of the managers of the province Gas
Company and some of structure engineering, design and planning and project managers of the National Gas Company with management field of study or related experience. The number of professors is 10 and the number of managers is 60.

**Fig. 1:** Conceptual model.

According to the nature of the study and questionnaire, the study was acting as census and the whole society was examined. For data gathering statistical samples were used and for questions of the research native questionnaire "structural changes required for East Azarbaijan Province Gas Company to achieve business with focus on technology development" with three dimensions complexity, formalization and centralization has been used.

**Table 1:** Research variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dimensions</th>
<th>Number of Questions</th>
<th>Question Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required structural changes of the gas company to achieve business focusing on technology development in the present and desirable situations</td>
<td>complexity</td>
<td>8</td>
<td>1-8</td>
</tr>
<tr>
<td>formalization</td>
<td>6</td>
<td>9-14</td>
<td></td>
</tr>
<tr>
<td>centralization</td>
<td>9</td>
<td>15-23</td>
<td></td>
</tr>
<tr>
<td>All questions</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this research stability of the 23 items is 0.803 which is a high proportion.

For data analyzing, descriptive and inferential statistics were used where in descriptive statistics level data were analyzed using statistical indices like frequency, percentage, average and sum of the scores, and for measuring the effective factors in information seeking behavior and questions testing, single sample t-test was applied.

1. **Data analysis:**

First, structural changes variable required for East Azarbaijan Province Gas Company to achieve business focusing on technology development, is calculated by "compute" and "spss" commands for the whole sample which involved 70 respondents. Then the average tent for the society was applied. Finally the main variables were assessed and compared with each other. Results are shown in the following tables:

**Results:**

**Table 2:** Assessment of the complexity variables average in present and desirable situations.

<table>
<thead>
<tr>
<th>Main variables</th>
<th>Numbers</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complexity in the present situation</td>
<td>61</td>
<td>2.12</td>
<td>4.38</td>
<td>3.3258</td>
</tr>
<tr>
<td>Complexity in the desirable situation</td>
<td>70</td>
<td>2.50</td>
<td>4.88</td>
<td>3.5893</td>
</tr>
</tbody>
</table>

According to the above table, it's clear that average score of complexity variable in the desirable situation (3.5893) is higher than the present situation (3.3258).

**Table 3:** Assessment of formalization variables average in present and desirable situations.

<table>
<thead>
<tr>
<th>Main variables</th>
<th>Numbers</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formalization variable in the present situation</td>
<td>61</td>
<td>2.43</td>
<td>4.43</td>
<td>3.7190</td>
</tr>
<tr>
<td>Formalization variable in the desirable situation</td>
<td>70</td>
<td>1.88</td>
<td>4.43</td>
<td>2.9163</td>
</tr>
</tbody>
</table>

According to the above table it's clear that average score of formalization variable in desirable situation (2.9163) is less than present situation (3.7190).

According to the above table it's clear that average score of centralization variable in desirable situation (2.6821) is less than present situation (3.3197).
Table 4: Assessment of centralization variables average in present and desirable situations.

<table>
<thead>
<tr>
<th>Main variables</th>
<th>numbers</th>
<th>minimum</th>
<th>maximum</th>
<th>average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralization variable in the present situation</td>
<td>61</td>
<td>3.25</td>
<td>4.25</td>
<td>3.3197</td>
</tr>
<tr>
<td>Centralization variable in the desirable situation</td>
<td>70</td>
<td>1.88</td>
<td>4.00</td>
<td>2.6821</td>
</tr>
</tbody>
</table>

Table 5: Assessment of organizational structure variables of Gas Company in present and desirable situation.

<table>
<thead>
<tr>
<th>Main variables</th>
<th>numbers</th>
<th>minimum</th>
<th>maximum</th>
<th>average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational structure in the present situation</td>
<td>61</td>
<td>2.75</td>
<td>4.00</td>
<td>3.4548</td>
</tr>
<tr>
<td>Organizational structure in the desirable situation</td>
<td>70</td>
<td>2.39</td>
<td>4.35</td>
<td>3.0626</td>
</tr>
</tbody>
</table>

According to above table average score of organizational structure variables in desirable situation (3.0626) is less than present situation (3.4548).

Q1. How is the desirable situation of East Azarbaijan Province Gas Company in attaining business framework focusing on technology development?

According to the statistics that in desirable situation 72.456 and in present situation 96.814 relates to the statistical score of ‘t’ it is visible that the desirable situation of the organizational structure of East Azarbaijan Province Gas Company in attaining business framework and focusing on technology development is less than present situation and therefore in order to achieve desirable situation, every organizational structure indicator is examined separately to determine which indicator of organizational structure has to be changed to reach desirable situation.

1. According to the statistics of complexity indicator in desirable situation 3.58929, has to be more than complexity indicator of the present situation with statistics3.32582.
2. According to the statistics of formalization indicator in desirable situation 2.91633, has to be less than complexity indicator of the present situation with statistics 3.71897.
3. According to the statistics of centralization indicator in desirable situation 2.68214, has to be less than complexity indicator of the present situation with statistics 3.31967.

Q2. How is the present situation of organizational structure of East Azarbaijan Province Gas Company?

According to the average obtained from organizational structure indicators’ statistics, complexity indicator in lower position compared to centralization and formalization indicators.

Of course, as for the averages obtained from complexity, formalization and centralization indicators which are more than average limit 3, we can say that these indicators are a bit more than average in the present situation and in order to achieve desirable situation, the complexity indicator has to increase and formalization and centralization indicators have to decrease.

Q3. How is the present situation of East Azarbaijan Province Gas Company?

According to the average obtained from organizational structure indicators' statistics, we conclude that all three indicators (complexity, formalization and centralization) are more than average limit 3, and we can say that these indicators in the present situation are higher than the average limit and the organizational structure of the province Gas Company enjoys relatively a desirable situation.

Conclusion:

Results show that the present situation of East Azarbaijan Province Gas Company with respect to the organizational structure to attain business focusing on technology development, is higher than the average limit in all three dimensions: complexity, formalization and centralization. However, by comparing the present situation on company with the desirable situation we observe that there is a gap between the present and desirable situations. Thus, in organizational structures new pattern codification of National Gas Company for attaining business framework focusing on technology development, noting the separation and specialization of duties, the complexity indicator has to increase but formalization and centralization indicators have to decrease with respect to the present situation.

For the realization of this fact, managers of this company have to consider the following solutions:
1. In the present research, formalization in the present situation decrease from 3.7190 to 2.9163 in desirable situation. Therefore, the lower the formalization than the average limit is, the more desirable the organizational situation will be.

So the managers of National Gas Company have to:
Reduce the number of jobs with written job explanation, enhance the deviation limit of employees, increase the employees’ freedom of action in compliance with rules and procedures, qualify written history of employees in each profession and create self-control and self-assessment systems instead of direct control of employees’ performance and job instructions in order to lower the formalization aspect.

2. In this research, organization’s centralization aspect decreases from 3.3197 in the present situation to 2.6821 in desirable situation, i.e. the lower the organization centralization, the more appropriate the organizational structure.

Therefore, in order to enhance the lack of centralization in the company, relative managers of the have to avoid senior managers participation in operational decision-making process and enhance the freedom of action of employees to attract their attendance in addition to avoiding direct interference of employees in decisions for new programs, increase managers right of delegation, increase trust to subordinates and give freedom of action to employees in directing their opinions.

3. According to the results of this study, organization complexity increases from 3.32 in the present situation to 3.5893 in desirable situation. Therefore, in case when some factors like shifting between offices inside company, average built of headquarters in both present and desirable situations enjoy equal situation, to create more desirable organizational structure, relative managers of National Gas Company have to reduce the ratio of managers who have high educational degree to the whole employees, avoid the supervision layers increasing, employ individuals with appropriate studies, maintain and establish suitable work force comparing whole human resources of the organization regarding separation of jobs and duties and specializing of jobs with required flexibility.

ACKNOWLEDGEMENT

Thanks to all the colleagues who have assisted in this study. This research was conducted with the support of East Azarbaijan Gas Company.

REFERENCE