Identification and Prioritization of Effective Organizational Structure Components (Case Study of Regional Electric Companies of Iran)

Omid Karavand

Department of Public Administration, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

Vahid Chenari

Department of Public Administration, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran (Corresponding Author)
vchenari@gmail.com

Ghanbar Amirnejad

Department of Public Administration, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

Abstract. The present research identifies and prioritizes the effective organizational structure components using content (theme) analysis and Delphi technique and hierarchical analysis (Case Study of Regional Electric Companies of Iran). The present study is applied based on purpose and is exploratory-survey based on the nature and method of data collection. The statistical population of this study includes 36 experts selected from Iranian regional electricity companies. They were identified through targeted sampling. To analyze the research data, statistical software MAXQDA2012, SPSS and EXPERT CHOICE were used. Using these statistical software, in order to test research questions, Kendall test have been investigated. In the qualitative phase, we analyzed and interpreted (coding) of concepts expressed by the experts of the regional electricity companies of Iran, including open, axial and selective coding. The Delphi method was then used

to localize and screen the indices obtained. In the content (theme) analysis phase, 20 factors were identified and after gathering the experts 'responses in Delphi periods, the members' concordance was assessed through SPSS software and by calculating the Kendall's coefficient of concordance for the questionnaires, and the investigation and concordance among the experts was obtained 81.9%. The results showed that 15 components were agreed upon by the experts. In the final step, the components were prioritized using the hierarchical analysis approach. The results of the hierarchical analysis showed that among the criteria, the complexity criterion was of the highest importance. The next priorities from the experts' point of view are the inhibitor or developer factors and the technology criterion.

1. Introduction

Structure refers to the relationships between the components of an organized set. Organizational theorists mainly focus on two types of structures: physical structure and social structure. Physical structure refers to the relationships between the physical elements of an organization such as buildings and geographical locations that businesses are carried out within them. In organizational structure theory, social structure refers to the relationships among social elements such as individuals, positions, and organizational units to which they belong. In early classical and modern theories of organization, the relationships that form the social structure of an organization were assumed to be static or repetitive, and change occurs when management orders to redesign the organizational structure. Open systems theory has brought ideas about organic growth and development that have inspired the evolutionary models of growth and change in the social structures of the organization. More dynamic views on the social structure of the organization were introduced by symbolic interpretive and postmodern theorists that incorporate structuring theory and ideas about new organizational forms such as network structures and virtual mechanisms (Andrews, 2016). Modern organizations need to rethink their structure in order to be able to compete and be effective in this complex world and present unstable

environment. According to Peter Drucker, organizational structure is a means of achieving the organization's long-term and short-term goals. One of the fundamental problems in the efficiency and effectiveness of organizations is their structural issues. And managers sometimes have to make sure the structure is efficient (Iran Nejad Parizi & Hosseinzadeh, 2011).Although government organizations are considered to be the backbone of government in implementing a country's general policies, surveys show that these organizations in Iran face numerous obstacles to organizational change in all sectors, and during recent years they have not had very coherent movement in their organizational improvement, which in turn has made government organizations not have a good performnace level. In such circumstances, it is necessary to evaluate the situation and to identify the main factors affecting the improvement of organization in order to improve the performance of organizations. Therefore, the present study seeks to answer the following questions: What are the effective organizational structure components using the content (theme) and Delphi techniques and hierarchical analysis (case study of regional electricity companies of Iran) and how are they prioritized?

2. Literature review

Organizational structure is a system in which organizational affairs are carried out and consists of three components: task, reporting, and authority. Structure determines the shape and specialty of the organization's activities and how the components are put together (Akbari, 2004). Mintzberg (1972) defines organizational structure as: The organization structure can be defined as the sum of all methods that characterize the tasks of individuals in separate sectors and then provide coordination between them (Atilano et al., 2017). Complexity is measured by the degree of professionalization of jobs within the organization. It can also be defined and measured by the number of places where work is done, the number of jobs, and the number of hierarchies that exist. Increasing complexity in the organization increases control and coordination problems. The complexity of the organization stems from the lack of confidence that exists in the environment. (Zarei & Bordbar, 2013). The most important witness to the intra-

organizational horizontal differentiation is the specialism and the internal segmentation of the organization, so that the two are interrelated. The higher the number of specialist staff and the longer the training course required and the higher the level, the more complex the organization (Zang et al., 2016). Vertical differentiation refers to the depth or height of the organizational hierarchy. With increasing levels of organizational hierarchy, vertical differentiation of the organization increases and organizational complexity increases. Higher levels of senior and operational management of the organization are a potential factor in disrupting communications that make it difficult to coordinate staffing sectors, management and to monitor operational activities by senior management (Zhou & Kaplanidou, 2018). In summary, differentiation based on geographical regions is the third element in defining organizational complexity, showing that although vertical and horizontal differentiations make organizational units more scattered, physical separation of units can also increase this complexity. Geographical differentiation refers to the scattering of units, facilities, and human resources geographically. This differentiation shows the extent of scattering of departments, factories, and individuals of the organizations by geographical regions. (Sangier, 2011). Formality refers to the standard level of organizational jobs. In a formal organization, organizational relationships are described to employees in writing and precisely according to the organizational chart, and if necessary, subsequent changes are formally communicated by the manager, but in an informal organization, organizational relationships are verbally expressed to employees and they are changed naturally, if necessary (Salajeghe, 2014). Centralization in the hierarchy of authorities is referred to the level of authority that has the power to make decisions. When the decision is made at the top of the organization, the organization is called to be centralized. When decisions are made at lower levels of the organization, the organization is called to be decentralized (Shaou et al., 2016).

Table 1. Summary of domestic and foreign studies

Variable	Component	Dimension	Indicator	Resource
Organizational structure	Inhibitor	Formality	Hard and inflexible rules and procedures Considering problems as constraints and entanglements Demands for conformity and agreement Punish for mistakes Promoting mistrust	(Akbari, 2004) (Atilano et al., 2017)
		Centralization	Demands for control compliance Punishing employees Not encouraging to change despotic rules	(Acharya and Bijaya, 2016) (Ehsani, 2004)
		Process	Unilateral decision making Applying pressure for the job	(Ahmadi Mansour et al., 2015) (Azin, 2013)
		Context	Mistrust of employees Deception Conflict Creating a feeling of powerlessness and not having influence in individuals	(Aryan et al., 2015) (Azkia & Ghaffari, 2007)
	Empowering	Formality	Promoting flexible rules and procedures Considering problems as learning opportunities Accepting differences in values Encouraging innovations Developing trust	(Stone, 2001) (Islam et al., 2006) (Ashrafi & Azarmand, 2014)
		Centralization	Facilitating the problem solving process Promoting collaboration Encouraging openness Supporting employees Seeking participation Encouraging innovations	(Aghaei & Aghaei, 2011) (Aldaf, 1998) (Alexio et al., 2018) (Elken, 2009)
		Process	Participatory decision making Problem solving	(Alvani Mansour et al., 2012), (Allison et al., 2018), (Amirnejad, 1396)
		Context	Trust Honesty and credibility Integrity Creating a sense of power	(Amiri and Entekhabi, 2013). (Anne and Kim,

Variable	Component	Dimension	Indicator	Resource
			and influence in individuals	2017) (Anad et al., 2018)
	Complexity	Horizontal differentiation	Differentiation between organizational units, based on the position of the organization members, the nature of their tanks and the level of education and training they have received.	(Anthony et al., 2018) (Andrews, 2016) (Iran Nejad Parizi and Hosseinzadeh, 2011)
		Vertical differentiation	Number of organizational levels required in the organizational hierarchy Span of supervision Degree of centralization	(Izadi Yazdanabadi & Behrangi, 2006) (Burt, 2002)
		Geographical differentiation	Geographical dispersion of units, facilities and human resources	(Bartolini & Sarakino, 2015) (Barisawa et al., 2018)
	Formality	Standard level of organizational jobs		(Bastani & Razmi, 2015) (Basol & Digirliogol, 2014)
	Centralization	Levels of hierarchy of authorities		(Bourdieu, 1985), (Bellevue et al., 1996)

3. Method

The research is applied in terms of purpose and in terms of the nature and data collection it is exploratory and survey research. The statistical population of this research is based on the experts of regional electricity companies of Iran, 36 individuals were selected as statistical sample based on purposive sampling method. In this study, semi-structured interviews were used to obtain and extract components in content (theme) analysis technique. In addition, other data gathering instruments used in this research are a 5-point Likert scale questionnaire for use in Delphi technique and a paired comparisons questionnaire for hierarchical analysis. In this research, first, by analyzing the texts and interviewing, we extract the components using content analysis technique and after extracting these components, we identify them through experts and using Delphi technique. The Delphi technique is

based on experts' concurrence of over 80%. After identification using the hierarchical analysis technique, the priority and importance of each component are determined.

4. Findings
The present research is of a mixed type in which the factors were identified through an interview. To do so, a semi-structured interview with 36 experts of Iranian regional electricity companies was done. Summary of open and axial coding results based on the opinion of each respondent is presented in Table (2).

Table 2. Categories and subcategories related organizational structure

Dimension	Component	Frequency
Inhibitor or Developer	Formality	35
	Centralization	23
	Decision making	34
	Context (trust, honest, credibility)	27
	Size of organization	24
	Organization's internal environment	29
	Specialism	31
	Organizational conflict	30
	Delegation of authority	28
	Flexibility	27
Complexity	Horizontal differentiation	21
	Vertical differentiation	30
Knowledge management	Information management system	39
	Management system	42
	Partnership regulation	35
	Quality circles	23
Technology	Technology infrastructure	34
	Technology innovation	27

After analyzing the interviews with the experts of the categories and subcategories related to the organizational structure, it consists of 18 subcategories, which are categorized into 4 main categories: inhibitor or developer, complexity, knowledge management and technology, with 10 subcategories in the group of inhibitor or developer, 2 subcategories in

the group of complexity, 4 subcategories in the group of knowledge management, 2 subcategories in the group of technology. Aggregation of textual findings through content analysis (revealing) and qualitative interview through content analysis (theme analysis)

In order to identify the categories and subcategories of effective organizational structure, the researcher has first studied the theoretical literature of the research and other research in this field and then interviewed experts to identify the organizational structure components. By aggregating the categories and subcategories derived from the content analysis of the texts and responses of the experts' interviews about the effective organizational structure, the subcategories and the main categories extracted are categorized as Table (3).

Table 3. Aggregation of comparative findings and qualitative interview related to organizational structure

Dimension	Component	Extracted from
Inhibitor or developer	Formality	Texts and interview
	Centralization	Texts and interview
	Decision making	Texts and interview
	Context (trust, honest, credibility)	Texts and interview
	Size of organization	Texts and interview
	Organization's internal environment	Texts and interview
	Specialism	Texts and interview
	Organizational conflict	Texts and interview
	Delegation of authority	Texts and interview
	Flexibility	Texts and interview
Complexity	Horizontal differentiation	Texts and interview
	Vertical differentiation	Texts and interview
	Differentiation based on geographical regions	Texts
Knowledge management	Information mangemnet system	Texts and interview
	Training	Texts
	Management system	Texts and interview
	Quality circles	Texts and interview
	Technology infrastructure	Texts and interview
Technology	Technology innovation	Texts and interview
	Quality circles	Texts and interview

The results of Table (4) related to the variables affecting the organizational structure show that the highest rank belongs to management system, technology infrastructure, information management system, quality loops, flexibility, geographical differentiation, technology innovation, specialism, horizontal differentiation, context (trust, honesty, credibility), organization's internal environment, formality, centralization, organization size, vertical differentiation. The value of Kendall's coefficient of concordance has reached a value of approximately 0.819.

Table 4. Results of the first, second and third rounds of the interview along with mean of the expert's views

Dimension	Variables affecting organizational structure	Round 1			Round 2			Round 3		
		Number	Mean	Standard deviation	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Inhibitor or developer	Formality	36	3.27	.448	34	3.62	.421	30	3.88	.399
	Centralization	36	3.21	.460	34	3.47	.452	30	3.94	.405
	Decision making	36	3.18	.453	34	2.78	428.	----	----	----
	Context (trust, honest, credibility)	36	3.38	.496	34	3.65	.487	30	3.82	451.
	Size of organization	36	3.29	.455	34	3.48	.426	30	3.77	.318
	Organization's internal environment	36	3.27	.496	34	3.61	.662	30	3.91	0.334
	Specialism	36	3.46	.489	34	3.57	.507	30	4.03	.384
	Organizational conflict	36	2.23	.473	---	---	---	---	---	---
	Delegation of authority	36	1.37	.362	---	---	---	---	---	---
	Flexibility	36	3.55	493.	34	3.79	.507	30	4.07	.435
Complexity	Horizontal differentiation	36	3.35	.485	34	3.51	.499	30	4.04	.429
	Vertical differentiation	36	3.14	0.332	34	3.38	.421	30	4.01	.426
	Differentiation based on geographical regions	36	3.46	.471	34	3.73	.457	30	4.01	.438
Knowledge management	Information mangemnet system	36	3.61	468.	34	3.81	.454	30	4.12	.349
	Training	36	1.76	538.	----	----	----	----	----	----
	Management system	36	4.41	0.425	34	3.93	.410	30	4.11	.375
	Partnership regulation	36	3.11	520.	34	3.03	489.	30	2.93	.418
	Quality circles	36	3.55	.479	34	3.87	.461	30	4.11	.399
Technology	Technology infrastructure	36	3.88	.468	34	3.99	.448	30	4.33	.399
	Technology innovation	36	3.45	.475	34	3.68	.453	30	3.98	.419

Table 5. Kendall's coefficient of concordance

Round 3	Round 2	Round 1	
30	34	36	Number
.819	.748	.694	Kendall's coefficient of concordance
14	16	19	Degree of freedom
.000	.000	.000	Significance value

The hierarchical structure consists of four levels that target consists the first level and the second level consists the main criteria, the third level consists the subsidiary criteria and the fourth level consists the sub-criteria. The AHP method is used to determine weights of criteria and sub-criteria. In the AHP method, pairwise comparisons are made between each of the criteria levels and the pairwise comparison questionnaires are analyzed using the EXPERT CHOICE software and their inconsistency rates are determined. If the inconsistency rate is less than 0.1, pairwise comparisons are acceptable.

Table 6. Criteria

Row	Symbol	Criteria	Weight
1	C2	Complexity	0.516
2	C1	Inhibitor or developer	0.307
3	C4	Technology	0.109
4	C3	Knowledge management	0.068

Table 7. Inhibitor or developer components

Row	Symbol	Sub-criteria	Weight
1	D7	Flexibility	0.276
2	D2	Centralization	0.248
3	D6	Specialism	0.151
4	D4	Context (trust, honesty, credibility)	0.125
5	D3	Organization's size	0.114
6	D1	Formality	0.059
7	D5	Organization's internal environment	0.026

Table 8. Complexity components

Row	Symbol	Criteria	Weight
1	E2	Vertical differentiation	0.653
2	E1	Horizontal differentiation	0.262
3	E3	Geographical differentiation	0.085

Table 9. Knowledge management components

Row	Symbol	Criteria	Weight
1	F1	Information management system	0.579
2	F3	Quality circles	0.307
3	F2	Management system	0.114

Table 10. Technology components

Row	Symbol	Criteria	Weight
1	G1	Technology infrastructure	0.702
2	G2	Technology innovation	0.298

5. Discussion and Conclusion

Organizations in our country should also think about renewing their structures and put customer orientation and attention to their demands on their agenda, give sufficient authority and responsibility to their intra-organizational units so that each unit responds to the client and customer directly. This requirement is especially visible in the public sector. The irresponsibility of organizations, them being wide and long, excessive controls, poor management, and generally a weak and sick structure make communication flows be ineffective both in and out of the organization and this creates an atmosphere of mistrust among individuals both within and outside the organization. So, first of all, the high wall of mistrust should be removed, both within and outside the organization, to replace the atmosphere of cooperation. The structure should then be scrutinized and analyzed with the help of individuals and the cooperation of experts to determine its strengths and weaknesses and to dominate a structure proportional to the cultural, social, economic and political situation in organizations. Since the purpose of this research is to identify and prioritize the effective organizational structure components using content analysis technique and Delphi and hierarchical analysis (case study of Iranian regional electric companies), firstly the components were identified through content analysis technique and using semi-structured interview. In this way, 20 components related to organizational structure were identified. The results of Delphi technique were evaluated in three rounds and finally it was agreed upon with concurrence coefficient of 81.9% with 15 components. In the third phase and the final phase, each component was prioritized using AHP. The

results showed that among the criteria, the complexity criterion was of the highest importance. The next priorities from the experts' point of view are the inhibitor or developer factors and the technology criterion.

References

Aghaei, H., Aghaei, F. (2011). Investigating Organizational Effectiveness in Social Capital on Employee Commitment Trust, Social Development, 2 (7): pp. 84-93

Ahmadi, Gh. Mehrpour, M. Nikouravesh, A. (2015). Organizational Structure, International Conference on New Challenges in Management, Ardabil, Ardabil Industrial Management Organization.

Alvani, M. Rahmani, M. Mohammad Nejad, A. (2012). Designing a Model for Improving Citizens' Social Capital Level in the Age of Globalization, Strategic Studies in Public Policy-Making, 3, 1-30.

Amiri, M. Entekhabi, A. (2013). Investigating the Impact of Structural Dimensions on the Success of Organizational Resource Planning System in Iranian Companies Having This System, Information Technology Management, 1 (6), pp. 47-70

Amirnejad, A. (2016). "Investigating the Impact of Organizational Structure on Organizational Agility with the Mediating Role of Organizational Culture, Management Science Quarterly of Iran, 2 (3): pp. 33-44

Anand Jha, Christopher J. Boudreaux, Vasabjit Banerjee (2018) Political leanings and social capital, Journal of Behavioral and Experimental Economics, 72,95-105

Andrews, R.(2016).Organizational size and social capital in the public sector does decentralization matter? Review of Public Personnel Administration,15, 18-47.

Antoine Habersetzer, Sandra Grèzes-Bürcher, Ron Boschma, Heike Mayer (2018) Enterprise-related social capital as a driver of firm growth in the periphery?, Journal of Rural Studies, 4, 67-87.

Arian, R. S. & John, G., & Martin, J. (2015), "Structural Organizational Effectiveness Factors"2014

Ashrafi, Y. Azarmand, Z (2014) Analysis and design of an appropriate organizational structure for middle municipalities; Case Study: Saveh municipality. Urban Planning Geographical Research, 2 (1), 119-142.

Aston, J. (2001). Elite values versus organizational structure in predicting innovation. Administrative science quarterly, 279-290

Atilano José Pena-López∗, José Manuel Sánchez-Santos.(2017). Individual social capital: Accessibility and mobilization of resourcesembedded in social networks, Social Networks,Volume 49, May 2017, Pages 1-11

Azin, M. (2013). Investigating the Impact of Social Capital on Job Satisfaction (Case Study: Headquarters Area of Ministry of Energy), Public Management Mission (Public Management), 7 (12): pp. 81-88

Azkia, M. Ghafari, Gh. (2007). Rural Development with Emphasis on Rural Society of Iran. Second edition, Tehran: Ney Publication.

Bartolini, S., & Sarracino, F. (2015). The dark side of Chinese growth: Declining social capital and well-being in times of economic boom. World Development, 74-351-333.

Basol, E. H., & Dogerlioglu, O. L. (2014). The relationship between organizational characteristics and the structure of the information services function. Mis Quarterly 68-57.

Borisova Ekaterina, Andrei Govorun, Denis Ivanov, Irina Levina (2018) Social capital and preferences for redistribution to target groups, European Journal of Political Economy, 54, 56-.67

Bourdieu, P. (1985). The social space and the genesis of groups. Information (International Social Science Council), 24(2), 195-220

Ehsani, P. (2014). Social Capital Management in Organizations, Management Science Quarterly of Iran, 4 (13): pp. 47-65

Iran Nejad Parizi, M., Hosseinzadeh, A. (2011). Presenting an Effective Organizational Social Capital Model (Case Study: Government Organizations of Khorasan Razavi Province). General Policy Making in Management, No. 2, 17-34.

Salajeghe, A. (2014). Investigating the Relationship between Social Capital and Organizational Effectiveness in Shafa Hospital Training

Center, Improvement and Development Management Studies, 1 (1), pp. 55-62

Sangnier, M. (2011). The co-evolution of social capital and financial development, Economics Bulletin, 14,1-23

Shaou, L., Paré, G., & Bergeron, F. (2016). Matching information technology and organizational structure: an empirical study with implications for performance. European Journal of Information Systems, 4(1), 3-16

Shun Wang (2018) Social capital and Rotating Labor Associations in rural China, China Economic Review, 5, 78-98.

Zarei, M. Bordbar, Q. (2013). Investigating the Impact of Organizational Social Capital on Promotion of Knowledge Management Level in Yazd Welfare Organization, Applied Sociology, 4 (24): pp. 227-244

Zhou Ran, Kaplanidou Kyriaki (2018) Building social capital from sport event participation: An exploration of the social impacts of participatory sport events on the community, Sport Management Review, 21, 5, 491-503.