

The Impact of Organizational Structure on Organizational Performance by Applying Balance Scorecard: A Case Study

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Abstract

The purpose of this paper is to use the balanced scorecard as a performance evaluation tool for review Organizational structure variables are on organizational performance in Isfahan steel industry. Robbins (1998) standardized questionnaire was used to collect data. To evaluate aspects of organizational performance, standard Hersey and Goldsmith questionnaires were used. The sample used included 100 managers and senior experts working in Zob Ahan Company of Isfahan. The results showed that there is a significant relationship between organizational performance and organizational structure and its components including complexity, formality and concentration. Also, the findings showed that concentration has the greatest effect on organizational performance. The results of the Bartlett and Kaiser-Meier tests indicated the high reliability of the research (0.89 and confidence level less than 0.05). Also, by using correlation coefficient, regression test and structural equations, research assumptions were confirmed. The regression results show that concentration (with a coefficient of 0.59) had the greatest impact on organizational performance.

Keywords: Organization structure; Organizational performance; balanced scorecard; linear regression

1. Introduction

Organization studies have long been a major issue for researchers in the field of management. Precise studies of organizations can improve their performance and prevent their deviation and degeneration, from both potential and factual dimensions. The success or failure of any organization depends on amount of people efforts in the organization and especially organizational structure in order to achieve aims of firm that is possible by efficient use of hardware and software resources (Ağar, 2012). If organizations be consistent with the tasks and goals and be governed based on the scientific principles, their efficiency and productivity would increase and they would were successful in executing orders and achieving organizational goals (Bridges et al., 2017).

Integrating circular economy (CE) principles into organizational strategies has become essential for companies committed to sustainability and resource efficiency. This study examines the adoption of CE principles and the role of the Balanced Scorecard (BSC) as a facilitating tool, and by establishing the importance of CE adoption, this paper examines the existing BSC models that include sustainability aspects. (Martín-Gómez et al, 2024)

Organizational structure is the framework of the relations on jobs, systems, operating processes, people and groups making efforts to achieve the goals. Organizational structure is a set of methods dividing the task to

determined duties and coordinates them (Bhagwat & Sharma, 2007). The organizations create the structures to coordinate the activities of work factors and control the members' actions (Chand et al., 2005).

An organization is a systematic process of interpersonal relationships to achieve certain goals. An assessment of the performance of organizations can be a good measure to assess the proper use of resources available to organizations. If organizations are not able to properly address their goals, they will waste organizational resources. Organizational structure does not always remain stable, but forms the organization's affairs, and organizational affairs can change its form. Therefore, it should be acknowledged that the emergence and development of a structure is a continuous process. The three components of complexity, formalism and Concentration are introduced as the main dimensions of organizational structure. Obviously, the complexity, formality and Concentration of affairs are not random phenomena. Organizational structure is nothing but the result of the simultaneous effects of multiple factors. In some cases, the structure of organizations may reflect the attitudes or styles that special people have specified at a particular time.

Performance management and evaluation are widely accepted as one of the main features of human resource management in contemporary organizations (Fadeyi & Ajagbe, 2015). It is very important to note what factors can affect the performance of organizations. There are a

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wide range of internal and external factors affecting the performance of organizations. The study and improvement of these factors can improve the mutual performance of the organizations.

In literature, researchers have suggested that types of organizational structures have considerable impacts on leadership styles, organizational performance, innovation, employees trust and job satisfaction levels, perceived fairness, individual job performance, job involvement and learning organization (Hao et al., 2012, Jiang,2011, Kaplan & Norton,1993).

A contingency theory approach was explored to investigate the role of Balanced Scorecard (BSC) as a performance management system. Contingencies, including perceived environmental uncertainty and business strategy, are examined to understand their impact on BSC implementation and organizational performance, with a particular focus on the mediating role of BSC, and the findings of this study contribute to the understanding of factors that can influence implementation. BSC helps to influence manufacturing companies. This study also helps businesses to understand why they should use BSC to get the right information to make decisions and improve their organization's performance. (Abu-Allan, 2024).

Naziri (2012) research suggested that there is a weak inverse relationship between organizational structure and organizational entrepreneurship. Shoaie (2011) research suggested that there is relationship between organizational structure (formality), organizational structure (complexity), organizational structure (concentration) and creating knowledge. Slaver et al. (2011) have demonstrated that competition policy has a positive effect on organizational structure and its performance, while the organization's focus has a negative effect on organizational structure and its performance. Long et al (2012) stated that a systematic information processing requirements can determined the organizational effectiveness and its relation to structure so that people can have access to an appropriate amount of information. Fadeyi et al (2015) examined the impact of organizational structure on organizational performance. Their finding revealed that performance of an organization largely depends on the structure of the organization which implies that when a clear structure exists , people perform better , tasks are divided and productivity is increased,

Kaplan and Norton (1993) are believed to be the first who introduced the idea of balanced scorecard (BSC) as a new method for measuring the performance of a system. The idea of BSC is to centralize non-financial items affecting the efficiency of an organization. In the past, financial factors were only considered for performance evaluation. However, BSC developed the indices toward four outlooks of growth and learning, internal processes, customer and finance and intended to balance financial goals with non-financial ones (Katsikea et al., 2011).Fig 1 demonstrates the details of the financial and non-financial parameters. Customer perspective, financial perspective,

internal processes perspective and learning and growth perspective are four major components of the Balanced Scorecard that make an attempt to answer these four critical questions: 1. How do customer's regard us (customer perspective)?, 2. How do shareholders regard companies (financial perspective)?, 3. In what processes should companies be prominent (internal processes perspective)?, 4. How do companies create improvement and value propositions (learning and growth perspective)? A survey conducted by Brain and Company in 2005 showed that 57% firms of the world were using Balanced Scorecard as Performance Management System including the 64% organizations of North America and 75% of world large firms (Long et al., 2012).

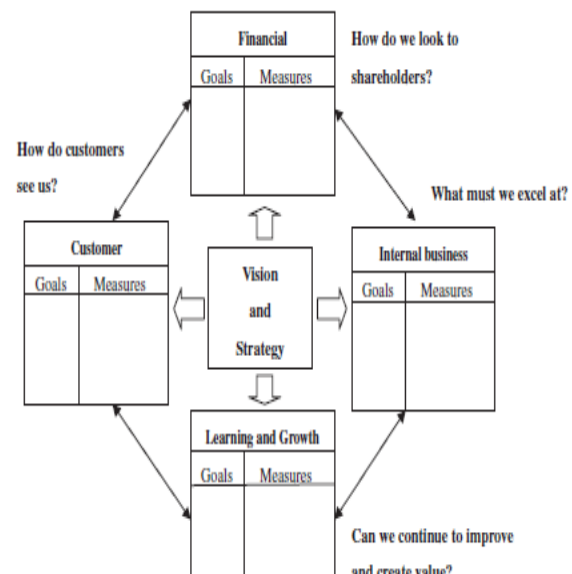


Fig 1. The four perspectives of balanced scorecard

It is also noted by Kaplan and Norton (2001) that a mix of lead and lag indicators will enable employees to differentiate between measurers they could not control and measures that can be influenced by their action. Leading indicators are also known as short term performance drivers.

This paper aims to apply balanced scorecard as an evaluation performance tool to investigate the impact of organizational structure variables (formalization, complexity, and Concentration) on the performance of steel industries. The study of organizational structure has long been considered by researchers and experts in the field of public administration; however, does not receive enough attention.

Within the scope of research, it is assumed that organizational structure variables (formalization, complexity, and Concentration) affect organizational performance. In order to test the relationships among them, the following research hypotheses are developed:

Main hypothesis Organizational structure in steel industries has significant positive impact on

Organizational performance.

Sub-hypotheses

H1. There is a meaningful relationship between the formalities and the performance of steel industries.

H2. There is a meaningful relationship between the Concentration and performance of steel industries.

H3. There is a meaningful relationship between the complexity and performance of the steel industries.

2.Methodology

The research method used in this paper is a kind of applied research, but it is descriptive in terms of methodology. In this research, statistical models and statistical assumptions were used. The library method as well as interviews and questionnaires were used. The library method and the questionnaire were used to gather the information needed to prove the statistical hypotheses in the research. The figure below shows the model of research.

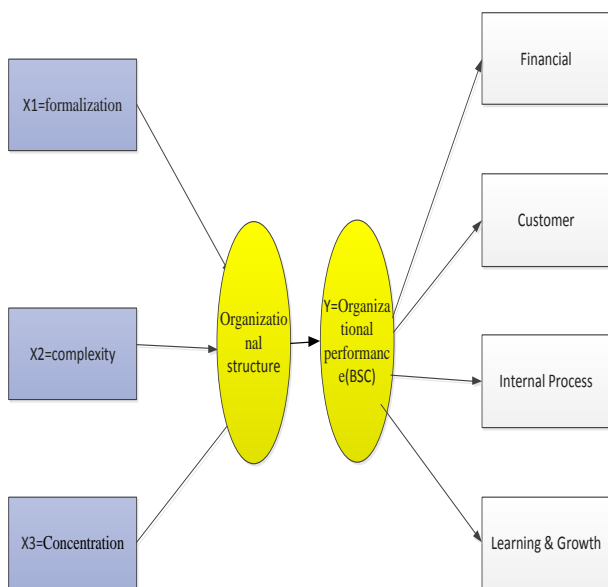


Fig 2. Research model

Three dependent variables of the organizational structure that were considered in this research based on the Robbin's model are a) formalization, b) Concentration and c) complexity. There are many factors that can be considered to determine the structural dimensions of the organization, including administrative components, independence, concentration, complexity, empowerment, formalization, composition, and professionalism, field of control, specialization, standardization and scope (Liao et al., 2010). The majority of organizational theorists agree on three dimensions of Concentration, formalism and complexity, which are still used extensively in steel industries.

The complexity refers to the degree of separation that exists within the organization and is divided into three categories: the horizontal separation between the organizational units based on the location of the organization, the nature and tasks of those organizations, and the level of education and training that they have covered. Complexity, includes vertical and geographic complexity (Mehrabian et al., 2013).

The most important evidence that implies a horizontal separation within an organization is the specialization and internalization of the organization. The vertical separation refers to the depth or height of the organizational structure.

With increasing levels of organizational hierarchy, the vertical division of the organization and the complexity of the organization have increased. The geographical breakdown refers to the dispersion of departments, factories, and individuals of the organization based on geographic regions (Robbins, 2009)

Formalization means the extent to which an organization relies on laws, regulations and procedures to direct its employees' behavior, and the extent to which organizational jobs have been standardized; if the job has a high degree of formality, the manager is required to specify the activities related to that occupation with some degree freedom.

Formalization is not limited to determination of what everyone's duty is, and how they should do it, but more broadly, they can deal with all types of behavior in an organization, such as clothing encoding, opening hours, using office equipment or using the Internet (Naziri, 2012).

Organizational Concentration means that the center of gravity of decision-making is at the top of the organizational hierarchy. In other words, the decision making authority in the organization is limited to the head of the organization and that all or at least the majority of the organization's decisions are taken by senior executives (Rabbinz, 2012).

2.1.Data Collection Tools

The data gathering tools used in this study was the questionnaire and interviews were also used if necessary. Independent variables were organizational structure variables and dependent variable was organizational performance. A standardized Robbins's (1998) questionnaire was used to assess the organizational structure and Hersey and Goldsmith's standard questionnaire was used to assess aspects of organizational performance. In this research, the collected data was first subjected to a good fit test, in order to obtain the necessary information about their distribution. The inferential statistics tests was used to investigate the research hypotheses. In this way, we could test whether or not to reject hypotheses. All statistical calculations in this study were done using the latest version of SPSS and

Minitab software.

2.2. Domain of research (thematic, spatial and temporal)

The present research examined the impact of organizational structure variables on the performance of steel industries. The selected organization was a “steel industrial units “in Esfahan province in Iran. In terms of time, the scope of the research is related to the performance evaluation of the steel industries in 2020-2021. On the other hand, organizational structure variables were reviewed and the performance of the organization was evaluated. At the end, the relationship between dependent and independent variables was measured.

2.3. Statistical Population and Sample

After determining the research environment, considering the dispersion of the target population in the research and the lack of access to all of the subjects, 100 people were selected according to the sampling criteria (95% confidence level, sampling errors between 0.1 to 0.5, and the highest level of variance). The sample were selected by using the sample size estimation formula. It should be noted that simple random sampling method was used to avoid bias (each individual has an equal chance to be selected as statistical population).

The statistical population consists of people with a combination of age, gender and educational background. Sampling was done by random and cluster classification method. To calculate the sample size, the following equation was used:

$$n = \frac{NZ_{\frac{\alpha}{2}}^2 \times P(1 - P)}{\epsilon^2(N - 1) + Z_{\frac{\alpha}{2}}^2 \times P(1 - P)} \tag{1}$$

Z: The value of the unit's normal variables, at 95% confidence level. ($Z_{\frac{\alpha}{2}} = 1.96$)

N: The size of the community is about 97 people.

Epsilon: Allowed error value. $\epsilon = 0.05$

The value of P is equal to 0.5. if $P = 0.5$, then n finds its maximum. This causes the sample to be large enough

Therefore, the sample size required for research with approximation equals 97 which was distributed among 100 people to obtain more accurate results.

Validity in fact indicates that the measurement tool measures the desired attribute. Without the knowledge of narrative, the accuracy of the data obtained cannot be guaranteed. In sum, there are several methods for determining the validity of measuring instruments, including content validity, criterion validity, and construct validity. Content validity is used to examine the constituent parts of a questionnaire or tool and depends on its constitutive questions. If the questions reveal the specific features and skills that the researcher intends to measure, the questionnaire is valid. Content validity is

usually determined during the design of the tool and by persons specializing in the subject matter.

The questionnaire in this study was designed based on previous studies, especially theoretical studies. On the other hand, this questionnaire was provided by experts and its content validity has been confirmed.

Cronbach's alpha coefficient (the following formula) was used to examine the reliability of the questionnaire. Since the questionnaire was designed in the form of a Likert spectrum and is in fact a type of attitude gauge, the most suitable method for calculating validity was the Cronbach's alpha coefficient.

$$\alpha = \frac{k}{k - 1} \left(1 - \frac{\sum_{i=1}^k S_i^2}{s^2} \right) \tag{2}$$

K: number of questions

si; variance of each question

s:total variance

The results showed that the calculated alpha coefficient for the whole questionnaire was 0.82. Considering that the calculated reliability coefficients were more than 0.70, it can be concluded that the questionnaire used has the necessary research reliability.

On the other hand, examination of the status of each questionnaire in order to measure the internal consistency of the questions showed that the deletion of questions did not increase or decrease significantly the validity of the questionnaire. It can be concluded that the questions of the questionnaire used had a good internal consistency.

3.Statistical Analysis and Hypothesis Testing

In this section, using appropriate statistical techniques that adapted to quantitative variable and relative measurement scale, the information was collected, classified and analyzed.

The researcher used descriptive statistics to summarize the collected data by supplying the distribution table and answer the research questions using inferential statistics.

3.1.Descriptive statistics

The researcher has distributed 100 questionnaire among the sample population for collecting raw data (views and opinions of the statistical community).

Table1
Students' Educational Status

Category	percent
Diploma class	5
Associate degree	28
Bachelor Degree	37
Master Degree And PhD	30
Total	100

The table above shows the 37% of the participants had BA that was the highest number of undergraduate staff.

Table 2
 Status of employees' employment record (working experience)

		percent
Category	Less than 5 years	10
	6-12 years	18
	12-20 years	62
	Greater than 20 years	10
	Total	100

The above table also indicates that the maximum working experience was between 12 years old to 20 (62%). Table 3 shows descriptive variables (mean, standard deviation, maximum and minimum scores) were calculated for variables.

Table 3
 Descriptive information of variables (n=100)

Descriptive information of variables (n=100) Variable	mean	standard deviations	Maximum scores	Minimum scores
complexity	4.8414	.81894	5	1
Concentration	4.7143	.65868	5	1
formalization	4.10057	.74447	5	1
Learning and Growth(L,G)	4.7857	1.03146	5	1
Internal Process(IP)	4.8400	.85049	5	1
Customer©	4.9459	1.07154	5	1
Financial	4.4444	.89156	5	1
Organizational performance	4.6449	.100936	5	1
Organization structure	4.6071	1.10014	5	1

3.2. Test the Main Hypothesis

To investigate and measure the main hypothesis of the research, that was the relationship between organizational structure and organizational performance, Spearman correlation coefficient was used. The results are presented in the following table 4:

Table 4
 Correlation Coefficient Results

correlation coefficient	The correlation	Sig.	result
Structure on the performance	0.49	0.000	is confirmed

According to the above table, it can be concluded that organizational structure has a significant relationship with organizational performance.

4-2-2. Sub hypothesis testing

Table 5ance:

Table 5
 Correlation between organizational dimensions and performance

	com	cen	for	L.G	I.P	Cus	F	O.p	O.s
com	1.0	0.331	0.616	0.424	0.106	0.474	0.127	0.400	0.507
Con		1.0	0.377	0.169	0.403	0.116	0.808	0.515	0.155
for			1.0	0.399	0.236	0.892	0.152	0.564	0.737
L.G				1.00	0.550	0.391	0.075	0.354	0.388
I.P					1.0	0.224	0.344	0.566	0.299
Cus						1.0	0.067	0.474	0.668
F							1.000	0.676	0.250
O.p								1.0	0.491
Os									1.0

Regarding the fact that the correlation test is for two-way relationship, and the researcher does not know which side is for the relationship, multiple regression tests were used. The results of the regression model can be credible if their presuppositions are in place. The precondition of applying a regression test to a variable series is that the dependent variable is continuous and has a normal distribution, and the residues must be independent and have normal distribution Kolmogorov-Smirnov test was used to examine the normality of the dependent variable. Initially, we formulated the hypothesis of zero and the opposite: Table 6 shows the results of this test.

Table 6
 Kolmogorov test

Variables	Kolmogorov-Smirnov test	Significance level	Result
complexity	0.192	0.92	Normal
Concentration	0.254	0.75	Normal
formalization	0.169	0.84	Normal
Learning and Growth	0.162	0.99	Normal
Internal Process	0.261	0.78	Normal
Customer	0.194	0.82	Normal
Financial	0.091	0.95	Normal
Organizational performance	0.094	0.99	Normal
Organization structure	0.084	0.86	Normal

Regarding the distribution of data is normal, so regression can be used. Histograms and normal probability charts can also be used to check the normalization of residues (Fig. 3).

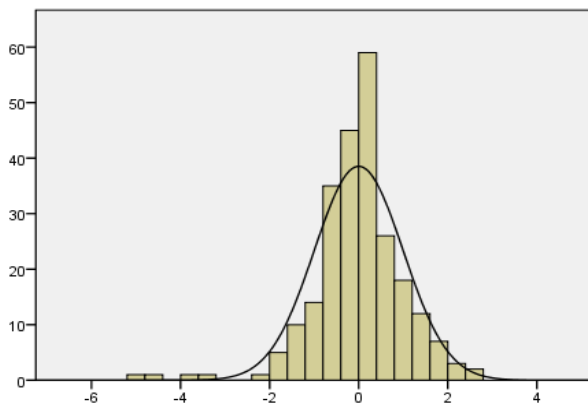


Fig 3. Remained standardized regression

According to the above chart, the residual values had a nearly normal distribution with an average of approximately zero and standard deviation of 1. Normality test results of the data is summarized in Table 7. As can be seen the significant level of research variables all are more than 0.05, so the null hypothesis is accepted. As a result, data on the variables, are normal. Therefore in this study, we are allowed to use para-metric tests Using correlation test an initial communication can be established to investigate the relationship between constructive factors. This type of communication or correspondence between constructive factors are used to see twofold correlation coefficient among constructive factors. Table 7 shows the values of the regression coefficient:

The above table shows a very strong correlation coefficient (Square = 0.849). There was a strong relationship between the research variables. To analyze

Table 7
The values of the regression coefficient

Modle	R	R2	Adjusted R Square	Std. Error of the Estimate
1	0.790	0.849	0.467	0.70104

the significance of multiple regression, we used variance analysis. We made the hypothesis zero and we test it using the variance analysis (Table 8).

H0: Regression is not significant.

H1: Regression is significant.

Table 8
Significance regression test (Analysis of the regression equation)

	Sum of squares (SS)	df	Mean squares (MS)	F	Significance level
Regression	6.313	1	6.313	52.69	0.001
Residual	11.794	98	0.120		
SUM	18.107	99			

According to the obtained F in the table, it can be concluded that at least one of the independent variables (predicted) was effective in predicting the dependent variable (response) and also considering that the level of significance level of the 0.001 model which was less than 0.01, the assumption H0 (regression is not significant) is rejected with a confidence level of 99%, that is, it can be said that the regression model was significant. In other words, at least one of the components of the organization had a significant relationship with the organization's performance.

Table 9 shows the linear relationship and the regression line equation:

Table 9
The regression line equation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
	Constant	1.358	.590		4.303	0.000
	formalization	.447	.465	.1100	14.931	0.000
	complexity	-.406	.478	-.187	4.741	.0000
	Concentration	.474	.181	.595	7.604	.0001

The results of the above table indicate that there is an inverse relationship between complexity and performance. According to the beta coefficient in the table above, a unit of change in the complexity of the organization, -0.187 causes the change in the organization's performance. The regression line equation is as follows:

$$Y (\text{organization performance}) = 1.358 + 0.447 (\text{formal}) - 0.406 (\text{complexity}) + 0.474 (\text{Concentration})$$

As you can see, the Concentration point is closely related to the organization's performance.

4. Conclusion and Suggestion

Quantitative analysis establishes a positive and statistically significant correlation between BSC alignment and organizational goals. However, implementation challenges, such as resistance to change, highlight the complexity of BSC integration. Positive findings emphasize the potential benefits of a well-implemented BSC in enhancing organizational performance and strategic alignment. The identified challenges emphasize the need for strategic considerations in addressing issues related to organizational culture and resistance to change. This research has implications for

theory and practice and emphasizes the importance of implementing a customized BSC to match the unique organizational context. This emphasizes the need for organizations to proactively address challenges in the implementation process to fully utilize the potential benefits of BSC. Future research should delve deeper into specific aspects, such as the long-term impact of BSC implementation, the role of leadership, and comparative analyzes across industries. Investigating the applicability of BSC in different organizational sizes and departments can provide a more comprehensive understanding of its effectiveness in different fields. In conclusion, this research provides valuable insights into the organization of the balanced scorecard system. It emphasizes the importance of aligning performance measurement systems with organizational goals for sustained success and provides practical implications for organizations seeking to optimize their strategic performance measurement practices. (Ibrokhimjon, 2024).

Applying Spearman correlation coefficient and regression, we tested the model hypothesis and all the assumptions were confirmed. We determined the regression line equation to show the relationship between the variables, which showed an inverse relationship between complexity and performance.

It should be noted that the Concentration had the greatest impact on organizational performance so that nearly 47% of changes in organizational performance changes resulted from Concentration dimension.

After obtaining the validity of the research, Spearman correlation coefficient was used to investigate the research hypotheses. Results showed that there was a significant relationship between organizational structure and performance. Also, there was a significant relationship between the components of organizational structure and performance but since the correlation coefficient is a two-way relationship, and the investigator wants to evaluate the effect of each of the independent variables on the dependent, multiple regression coefficients were used. The default of regression is the normalization of data, which was proved by the Kolmogorov-Smirnov test to be normal. The regression coefficient is 0.79, which shows a strong relationship between organizational structure and organizational performance.

Regression coefficients indicated a direct relationship between concentration and the performance of the organization, a direct relationship between formality and the performance of the organization, and the inverse (negative) correlation between complexity and the performance of the organization.

According to respondents, the organizational Concentration was relatively high and our assumption about the impact of Concentration on the organization's performance was confirmed. The acceptance of this hypothesis confirmed Hofstede's studies that showed the power gap in Iran is high. So concentration is an

influential element by accepting the existence of power gap among employees.

The second hypothesis, which evaluated the impact of recognition on the performance of the organization, was confirmed. The results showed that formality had an impact on the organization's performance. The formalization and Concentration shows that the work is clear, the reason for improving the performance of the organization by this can be explained by Hofstede's research. According to this study, Iranians avoid ambiguity to a high degree, and the reason for the acceptance of formality among office staff can also help to reduce job ambiguity and clarify their duties.

Also, the third hypothesis, which evaluated the effect of complexity on the organization's performance, was also confirmed.

Since almost all employees have a specific job during the period of their employment and they cannot be upgraded, specialization and, more generally, complexity affect the organization's performance.

Since complexity had an inverse relationship with the performance of the organization, it is suggested that organizational performance improve with decreasing vertical and horizontal levels and creating an appropriate context for communication between different levels of the organization.

Given the fact that organizational concentration and performance have a positive and significant relationship, decisions are taken at the top of the organizational pyramid and communicated to the officials and assistants. So attempt should not be made to delegate authority.

Regarding the fact that formalism had a direct and significant relationship with the performance of the organization, the rules and policies of the organization must be properly elaborated in order to avoid any ambiguity for the employees.

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