

Methodological Approaches for Assessing the Link between Supply Chain and Organizational Culture

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Abstract— The aim of this paper is to expand the knowledge of buyer-supplier relationships by investigating the extent to which organisational cultural fit between a buyer and supply chain participants influences performance. Findings demonstrate that complementarity rather than congruence between the supply chain partners achieved successful performance outcomes. Organisations in the high-performing supply chain had significantly different cultural profiles, reporting significant statistical differences across all six cultural dimensions. Organisations in the low-performing supply chain had almost identical profiles across all six cultural dimensions with significantly lower mean scores across each dimension. This article presents methodological approaches for assessing the organizational culture development of an educational institution. The research purpose is to study the feasibility and advisability of applying various methods to assess the level of the organizational culture development on supply chain management. The authors conducted an empirical study using quantitative methods (the maturity matrix of sustainable development of the organization and the Denison model), adapted to evaluate the level of the organizational culture development in a supply chain management.

Keywords— *organizational culture, supply chain management, values and components of organizational culture.*

1. Introduction

The increasing emphasis on integration among members of a supply chain has led to new mechanisms to help firms coordinate the flow of products, services, and information through the supply chain. Many studies support the importance and influence of supply chain integration on firm performance, but only a few focus on the organizational contextual factors influencing the integration. The problems of enhancing the

organizational culture in SCM remain as urgent as ever. In the context of global competition in educational services markets, research and development, intellectual products and other performance results in higher education institutions and modern SCM are becoming more multidisciplinary and diversified, requiring the formation of an appropriate organizational culture. This determines the norms, values, behavior models and traditions of a higher educational institution; it is one of the key tools for the formation of its competitive advantages and image. Besides the traditional academic culture, the modern SCM should develop elements of an entrepreneurial culture. The parity of academic and entrepreneurial components creates a solid foundation for the sustainable development of modern SCM. However, to ensure such parity, the administration needs to regularly assess the state of both the general level of organizational culture development and its particular elements, identifying their compliance/inconsistency with the organization supply chain strategy.

This research purpose is to systematize existing approaches to assessing the level of organizational culture, to study the possibilities of their adaptation to the higher educational institution activities and to solve problems while identifying components of organizational culture of a SCM that have a constructive or destructive effect on its competitive advantages and sustainable development.

2. Literature Review

There are various opinions about approaches to assessing the level of organizational culture development, its characteristics and impact on the organization's activities. According to [1-3], organizational culture has certain features, such as structural stability, depth, breadth and integration

of components [1]. In [2] believe that strong organizational culture enhances coordination and control. In [3] emphasize that organizational culture has a direct impact on the quality of processes in an organization. In [4] mentions financial stability as a key indicator for establishing the relationship between organizational culture and organizational performance. In [5] note labor productivity as the key indicator.

In [6] focus on the fact that a successful symbiotic strategy, based on a supportive organizational culture, can facilitate the replication of knowledge within an organization but creates challenges in emulating competitors. Such a culture should be pervasive within the organization, but at the same time, peculiar and unique to it. The best knowledge management strategies can cultivate an appropriate organizational culture and maximize profits.

Studying the influence of organizational culture on an organization's effectiveness, [7] found that clan or group culture contributes to a cohesive, highly effective team environment and increases the efficiency of projects.

Assessing the level of the development of organizational culture at a SCM and its impact on the SCM's external relations has been the focus of research for a number of scientists. In [8] note that sustainable projects at SCM aim at institutional transformation in strategic and systematic ways; they consider SCM to be open, dynamic systems, capable of learning and changes.

In [9] recognize that higher education institutions should play a decisive role in moving towards sustainable development, and that over the past few years, tools for assessing organizational culture have begun to play a significant role in strategies for the systematic and holistic reorientation of higher education institutions towards sustainable development.

In [10], [11] describe factors affecting the competitive advantages of SCM, such as knowledge exchange, the development of curricula and the formation of a value system.

The research results of [12] reflect the relationship between the type of organizational culture of the SCM and its quantitative and qualitative effectiveness. In [13], [14] and others have identified factors that influence cultural readiness for organizational change. Firstly, it is important to ensure consistency between the supported and accepted values among the institution staff, and secondly, it is extremely important to coordinate

this value congruence with the mission of the institution.

In our opinion, when researching organizational culture, it is feasible to use an integrated approach and consider organizational culture as a tool that has a comprehensive impact on the functioning of the entire system of organizational relations, and on the results of both individual efforts and the work of the staff as a whole.

In accordance with the problems selected for the study, we will adhere to the following interpretation of the SCM organizational culture: it is a complex of basic behaviors adopted by staff and students at a higher educational institution as the organization is influenced by external factors and internal integration. These behaviors improve the effectiveness of the SCM and increase its competitive advantages, while forming common values among members of the administration, teachers and students.

3. Methods

To assess the level of organizational culture development, approaches based on qualitative and quantitative methods are traditionally applied.

The models by [15], [16], [17], [18], [5] and [4] are some of the qualitative methods for assessing the level of organizational culture development.

V. Sathe's model emerges from the postulate that if shared values help the organization adapt and prove its usefulness, then the organizational culture that accumulates these values will lead the business to success. V. Sathe offers to consider the influence of organizational culture on life in an organization through the cooperation, decision making, control, communication, manifestation of loyalty, perception of organizational environment, and employee justification of their behavior. Moreover, the first three processes are related to the surface level of organizational culture or organizational behavior patterns and the next four – to the internal level, which is based on "values."

Focusing on successful American firms as a model and describing their managerial practice, [16] considered the importance of constant communication with the consumer, credibility of the actions undertaken, human capital priority, the importance of knowledge flexibility and rejection of diversification among the key values of organizational culture that promote an organization. T. Parsons' model [17] was developed based on the specification of certain functions that any social

system must perform to survive and succeed. The names of these functions together formed the acronym that became the name of the model – AGIL: adaptation, goal-seeking, integration and legacy. The essence of the model is that for their survival and prosperity, organizations must be able to adapt to constantly changing environmental conditions, integrate their parts into a single whole, and be recognized by people and other organizations. The AGIL model is based on the fact that organizational culture values are the most important tools in carrying out the functions of this model. If the values shared in the organization help it adapt to the situation, achieve its goals, combine its components and prove useful for people and other organizations, then focusing on achieving success, such a culture will impact the organization.

In [18] developed and concretized Parsons' ideas in the Competing Values Framework of Organizational Efficiency. The model they presented contains three dimensions: integration – differentiation; internal emphasis – external focus; tools / instruments – results / indicators. These measurements create four approaches.

Quadrant 1 – Human Relations Model – reflects the dominance of values aimed at maintaining social interaction, power decentralization and development of team cohesion.

Quadrant 2 – External Constituencies Model – prevailing values support the growth and adaptation of the organization, improving its competitive position in the market.

Quadrant 3 – Goal Achievement – prevailing values contribute to strengthening the competitive position of the organization through focusing on planning and efficiency.

Quadrant 4 – Internal Congruence – prevailing values are aimed at uniting and consolidating the team by centralizing power, strengthening the order and distribution of information.

The [4] singled out such components of organizational culture as self-improvement, leadership, the psychological climate in the team, high standards, which should be interpreted as employees' personal qualities, their loyalty, high productivity; focus on long-term goals; delegation of authority; fair remuneration and employee satisfaction. Meister linked these elements together and identified their influence on the financial

results in the organization.

Among the quantitative methods for assessing the level of development of organizational culture, the approaches proposed [19] and [20] should be considered in more detail.

The essence of the concept of situational scoring by L.S. Savchenko is to assign a specific score to each individual characteristic of organizational culture. The traditional five-point system is applied in this case. (Table 1)

Table 1. L.S. Savchenko's concept of situational scoring

An indicator of the level of development of organizational culture	Rating
5	Outstanding results
4	Very good
3	Average results
2	Low pass
1	Very poor

The generalized characteristic of organizational culture (I) is the sum of points for all selected components of organizational culture:

$$I = \sum_{i=1}^n I_i$$

where – I – is the organizational culture description and

– n – is the number of features to be analyzed.

The coefficient of the impact of organizational culture on the current processes (K_{imp}) is determined by the formula (2) and can be varied from 1 to 0.2, at $n=5$.

$$K_{imp} = I / n \quad (2)$$

If the coefficient of impact equals 1, then this is the organizational culture that is most conducive to the organizational growth and prosperity. In case this coefficient has the minimum value ($K_{imp} = 0.2$), then this indicates the inefficiency of the existing parameters of organizational culture, and, consequently, its negative impact on the organizational performance.

The Denison model is based on four cultural traits of effective organizations – adaptability, mission, consistency and involvement – that have the greatest impact on the organization. The model itself is a circle, which is horizontally divided into external and internal foci (Figure 1).

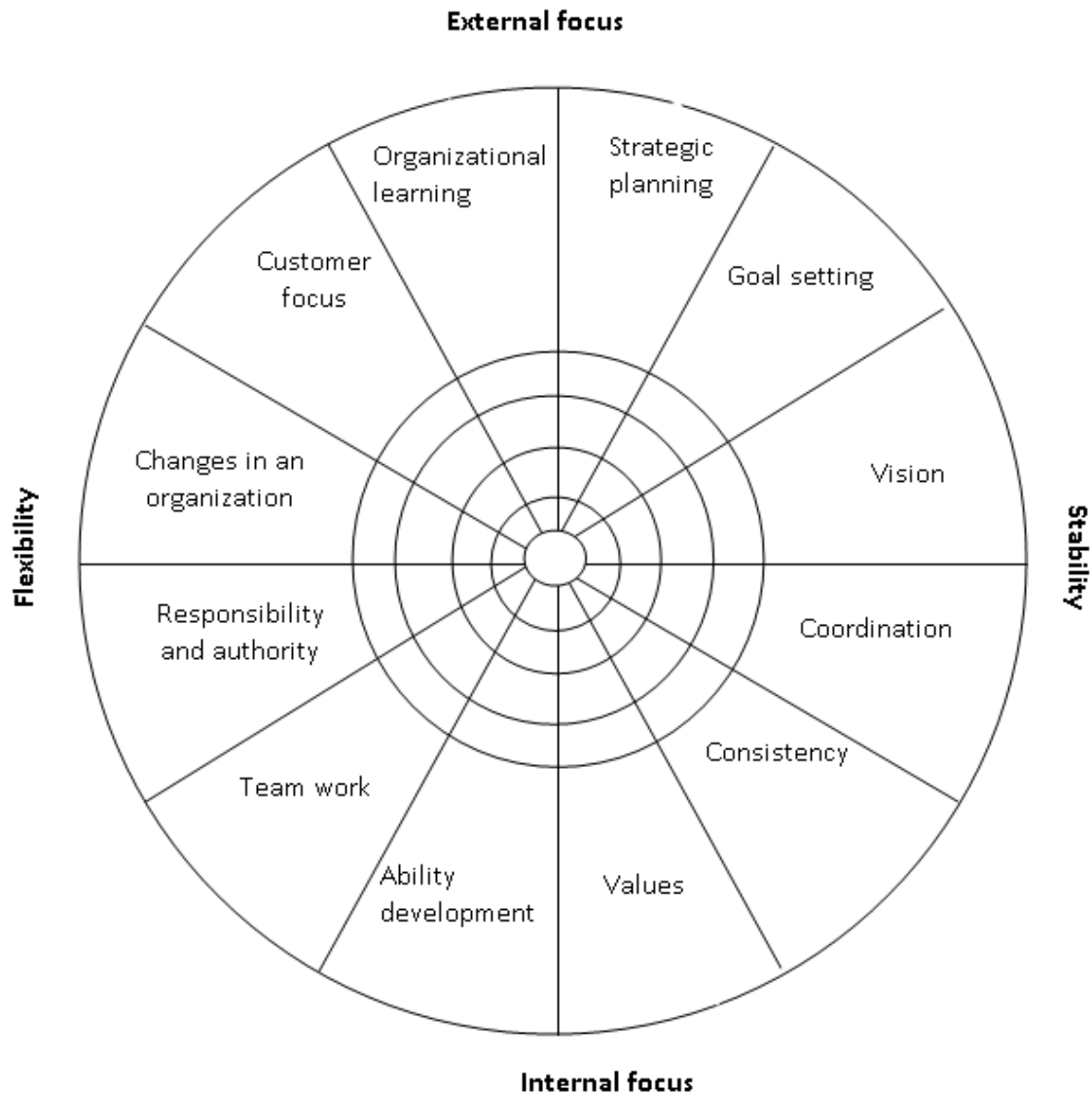


Figure 1. Graphic representation of the Denison model

The internal focus is determined by consistency and involvement, the external one – by mission and adaptability. The circle is divided vertically into a flexible organizational culture (left side) and a stable part (right side). Flexibility is determined by involvement and adaptability, and stability can be measured by consistency.

Diagnostics is based on a specially designed survey, including 60 statements. Each statement is rated on a scale of 1 (“strongly disagree”) to 5

(“strongly agree”), with the exception of eight statements that have a negative connotation and are rated on a reverse scale. Based on the results of the assessment of claims for each factor, an index is calculated that represents the average value of all statements within the framework of a single cultural characteristic. (Table 2)

Table 2. An algorithm for calculating the features of organizational culture according to D. R. Denison [20]

Organizational culture feature	Indicator name Mean value over all respondents, score			The value of organizational culture features, points; calculation algorithm (gr.2 + gr.3 + gr.4): 3
1	2	3	4	5
1.Adaptability	Changes in an organization	Customer focus	Organizational learning	
2.Mission	Strategic planning	Goal setting	Vision	
3.Consistency	Coordination	Agreement	Values	
4. Involvement	Capability development	Team work	Responsibility and authority	
Organizational culture , total	Calculation algorithm: (p.1 + p.2 + p.3 + p.4): 4			

In addition, D.R. Denison established a peculiar relationship between the organizational performance and features of organizational culture. Mission and consistency have the greatest impact on return on investment and sales, while consistency and involvement have the greatest impact on the quality and employee satisfaction. Involvement and adaptability have the greatest impact on the development of innovations, whereas adaptability and mission, on income and market share.

Thus, a study of structural approaches to assessing the level of organizational culture development has revealed that organizational culture has a direct impact on creating and developing organization's competitive advantages because it's a complex systemic entity that consolidates the most important cultural attitudes and values of both professional and personal worldviews. However, the issue of assessing this impact remains open since each existing technique has its own bottlenecks. In this regard and in our opinion, it is necessary to apply both qualitative and quantitative methods to obtain a clear idea of the level of organizational culture development.

4. Results

In order to assess the level of the organizational culture development of FSBEI HE Ogarev Mordovia State University, we used the data

obtained from a study of expert opinions using the matrix of sustainable development maturity (national standard GOST R 54598.1-2015 and its analogue BS 8900: 2006 Guidance for Managing Sustainable Development). Due to the fact that the principles of sustainable development correlate with the principles of organizational culture development, we consider it possible to use the maturity matrix of organization's sustainable development to assess the level of organizational culture maturity.

In accordance with the recommendations presented in the standard, a scale from 0 to 4 points was adopted, where 0 shows a complete lack of activity in this area, and 4 represents the maximum (reference) level of maturity. The experts (surveyed) were representatives of the administration, teachers, and heads of student associations at various faculties and institutes. The number of respondents who participated in the study was 847, of which 100 were academic staff and 747 were students.

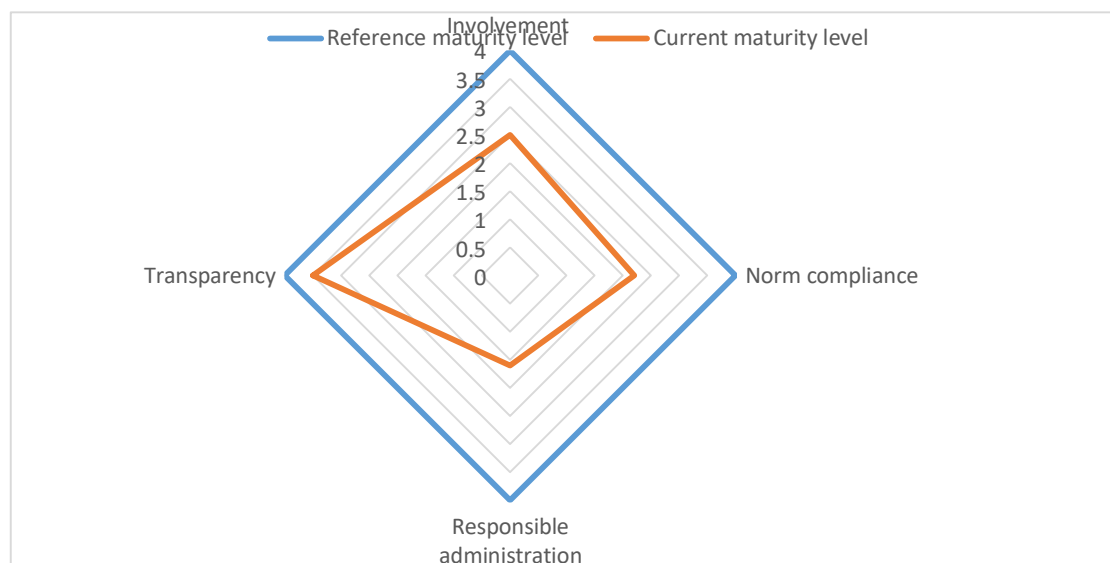
As a result of the work to assess the level of maturity of the organizational culture of FSBEI HE Ogarev Mordovia State University, we obtained the data presented in Table 3, based on the calculation algorithm shown in Table 2.

Table 3. The level of maturity of the organizational culture of FSBEI HE Ogarev Mordovia State University, score

Principles of sustainable development	The degree of organizational culture development	The average value obtained by the results of expert assessment	
Ethical compliance policy	Means of communication	2	2.2
	Leadership, management	2	
	Risk management and capacity building	2.5	
Involvement	Stakeholder agreement and task definition	2.5	2.5
Responsible administration	Sustainable development traditions	2	1.6
	Capability development	2.5	
	Key management and functioning tasks	1	
	Environmental factors analysis	1	
Transparency	Information exchange and building confidence	3.5	3.5
Overall maturity level		2.45	

The results shown in Table 3 demonstrate that almost all maturity indicators of the organizational culture of FSBEI HE Ogarev Mordovia State University comply with the average level. The overall maturity level is 2.45 points. The indicator reflecting the implementation of the transparency principle (the stage of maturity close to wisdom) is of the highest value, the indicator characterizing the

principle of responsible leadership (the stage of awareness transferring to engagement) is of the lowest value. The results of the implementation of the other two principles – compliance with ethical standards (involvement stage) and involvement (involvement stage close to the maturity stage) range from 2.2 to 2.5 points (Figure 2).

**Figure 2.** Organizational Culture Maturity Profile at FSBEI HE Ogarev Mordovia State University

In addition, we investigated the six basic elements of organizational culture, applying the Denison method (Table 4). The values were identified on a five-point scale, using the adapted Denison survey. In order to compare the results obtained by the

above methods, we applied the correction factor (0.8) for the results shown in Table 4. This allowed us to compare the results obtained in the study based on the maturity matrix of sustainable development and the Denison methodology.

Table 4. Expert assessment of the components of organizational culture of FSBEI HE Ogarev Mordovia State University according to the Denison methodology, score

Organizational culture components						The average value for all components
Teamwork	Coordination and integration	Change orientation	Organizational learning	Strategic planning	Vision	
Assessment results on a five-point scale						
3.5	3.3	3	3.5	3.6	3.2	3.35
Assessment results on a four-point scale (recalculation with a correction factor of 0.8)						
2.8	2.64	2.4	2.8	2.88	2.56	2.68

When analyzing the research data, it should be noted that the change orientation indicator has the lowest value, which means employees and students were less willing to change. At the same time, indicators such as strategic planning and teamwork were above average. Accordingly, when planning organizational changes, emphasis should be placed on SCM employees' teamwork, including inter-faculty relations and engaging student bodies, in order to develop an organization's culture.

The transfer of these assessments on a four-point scale (with a correction factor of 0.8) allowed us to conclude that the results of the study that were obtained by applying the maturity matrix of sustainable development and the Denison methodology are comparable.

A comparison of the results of assessing the level of the organizational culture development in FSBEI HE Ogarev Mordovia State University, obtained by different methods, is shown in Table 5.

Table 5. Aggregate numbers of the level of organizational culture development in FSBEI HE Ogarev Mordovia State University», score

General level of organizational culture maturity (assessment through the maturity matrix of sustainable development)	The average value for all components of organizational culture (assessment by the Denison model)
2.45	2.68

To interpret these results, we use a special scale (Table 6) which allows assessing the level of organizational culture development.

Table 6. The scale of assessment of the level of organizational culture development

Culture score	The level of culture development
1 – 1.99	Low
2 – 2.99	Average
3 – 4	High

The level of development of organizational culture in SCM was assessed as an average.

5. Discussion

The study allowed us to identify components of organizational culture in the SCM that do not have a high enough level of maturity, and they received less than 2.5 points. They include methods of interaction, leadership and management, traditions of sustainable development and, particularly, key tasks of management and functioning and environmental factors.

The basis for improving the SCM position and increasing the level of its organizational culture development can support elements such as strategic planning, organizational learning, teamwork, information exchange, and creating an atmosphere of trust [21].

The expected results of increasing the level of the

organizational culture development in the SCM may be:

- strengthening interaction in the academic community both within the SCM and outside it;
- building trust between all stakeholders (applicants, students, parents, academic staff, etc.);
- increasing internal cohesion of the academic staff by enhancing coordination and integration, as one of the basic elements of organizational culture;
- development of organizational learning, ensuring the formation of additional professional and personal competencies and social capital among employees, which helps strengthen the trust and competitive advantages of the SCM.

Transferring the organizational culture of the SCM to a new level will allow it to ensure sustainable development, become more flexible and ready for new challenges and modern requirements of the market of educational services, research and development.

6. Conclusions

The study of methodological approaches to assessing the level of organizational culture development showed that it is necessary to use a combined integrative approach to analyze the problems of developing organizational culture of modern SCM, given the multi-profile nature of their activities, involving the use of several assessment methods with subsequent interpretation of the results in their relationship and interdependence.

In this article, the authors tested the above-mentioned idea by applying two quantitative methods – the maturity matrix of sustainable development of the organization and the Denison model to assess the level of organizational culture development in FSBEI HE Ogarev Mordovia State University. As the study showed, the results of applying the matrix and model are not just comparable, but almost identical – the development indicators of the organizational culture of the SCM under study, obtained by two methods, correspond to the average level. The comparability of assessments not only of generalizing, but also of particular indicators of the organizational culture of the SCM was also noted, which made it possible to identify its strong and weak components.

Thus, the methodological approach proposed by the authors to study the level of the SCMs organizational culture development based on a combination of quantitative assessment methods

yields adequate results that can serve as the basis for the development of SCM program documents and operations management decisions of its administration related to improving the effectiveness of the SCM's activities, its sustainable development, preservation of existing and creation of new competitive advantages.

From the perspective of authors, the SCM of the tools applied (maturity matrix of sustainable development of the organization and the Denison model) determines the practical significance of the proposed approach and allows its wide application to assess the level of the organizational culture development in modern SCM. It is hypothesized that a Developmental culture will be the most effective in implementing supply chain integration.

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