Analysis of the Impact of Strategic Alliances on Relations with Stakeholders

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Abstract. The paper proposes a fuzzy model for the choice of strategies for interaction with stakeholders of an organization, participating in a strategic alliance. It is assumed that the entry of an organization into a strategic alliance leads to changes in its relationship with stakeholders. This, in turn, leads to changes in the expediency of applying various types of interaction strategies between them. It is also assumed that changes in the characteristics of the relationship between an organization and stakeholders depend on some characteristics of the alliance. In the model, relationship characteristics and alliance characteristics are given in a fuzzy form using term sets of linguistic variables. Determination of the most appropriate types of strategies for interaction between an organization and stakeholders is based on the fuzzy inference rule base.

1. Introduction

At present, a significant amount of research has been accumulated on the analysis of strategic alliances and their role in the modern economy. A comprehensive review of studies on strategic alliances and models of cooperation is given in the paper [1]. In this paper, the authors consider concepts of strategic alliances and identify the main forms of inter-organizational relationships: hierarchical relationships, joint ventures, cooperatives, cartels, franchising, subcontractor networks, strategic cooperation agreements, etc.

Typically, strategic alliances emerge when organizations seek new competitive advantages while avoiding market uncertainty and hierarchical rigidity. In the paper [2], the authors distinguish three criteria, according to which, strategic alliances create interdependence between autonomous economic units, bringing new benefits to partners in the form of intangible assets, and are obliged to make a continuous contribution to their partnership. At least two partner firms participate in a strategic alliance, which, first, remain legally independent after an alliance has been created, second, share the advantages and managerial control over the implementation of tasks and, third, make a permanent contribution to one or several strategic areas, such as technologies or products.

The motives for the formation of strategic alliances are quite diverse. Firms enter strategic alliances to increase their productive potential, reduce uncertainties in their internal structures and external environment and gain competitive advantages that will allow them to increase profits or to gain future business opportunities [3].

Stakeholders of organizations play a key role in the formation and functioning of strategic alliances. In this regard, the paper [4] analyzes the impact of previous relationships of organizations

with stakeholder groups on the result of the formation of a strategic alliance. The paper [5] examines the support of stakeholders of an international strategic alliance for the placement of shares.

At the same time, stakeholders can also enter strategic alliances when interacting with any organization to achieve common goals. The creation of a strategic alliance between stakeholders can also be a consequence of the adoption of any strategic decisions in an organization affecting the common interests of stakeholder groups. In the paper [6], the creation of a strategic alliance between stakeholder groups in response to decisions of enterprises to close production is considered and the influence of the alliance on these decisions is analyzed.

Strategic alliances arise between organizations in various fields. For example, strategic alliances and relationships between organizations in the public sector are considered in the paper [7]. The paper considers strategic alliances between healthcare providers and their relationships with stakeholders. It examines how service providers and customers perceive their organizational relationships and how the concept of strategic alliance can help to understand and improve the provision of high-quality healthcare services to clients.

Organizations with similar stakeholder groups can join strategic alliances to better meet stakeholder requests and obtain resources from them, which are necessary for successful operation. Thus, a network of entities can be considered, in which the interaction of stakeholder groups with several organizations participating in an alliance is considered. In such a network, each organization has different opportunities to influence other members of the network and/or the network as a whole [8]. In turn, the goals, strategies and actions of organizations depend on many stakeholders and are the result of the coordination of their interests, which allows talking about the multiplicity of "power centers" in a network [9].

It should be noted that relationships (and, therefore, their characteristics [10, 11]) between each organization and stakeholder groups in such a network can differ significantly from relationships between them in a network, in which there are no strategic alliances. Accordingly, the expediency of applying different strategies of interaction between them may change significantly.

For example, papers [12-16] are devoted to the development of models for choosing the most expedient types of strategies for interaction between an organization and stakeholders in certain conditions. In these and other papers, authors consider the relationship of stakeholders with one particular organization. It was not taken into account that these groups can simultaneously be stakeholders of other companies.

This paper proposes a fuzzy model, which allows assessing the impact of strategic alliances that include an organization on changes in the characteristics of relationships between this organization and its stakeholders and taking these changes into account when choosing interaction strategies.

2. Model

Let us consider the fuzzy model for the choice of a strategy for the interaction of an organization participating in a strategic alliance with its stakeholders.

In the paper [16], the following characteristics of strategic alliances were determined, which affect the change in the satisfaction of the *l-th* group of stakeholders in relation to the organization and the change in the degree of mutual influence (power) between the *l*-th group of stakeholders and the organization: the degree of strength (stability) of the formed alliance, the degree of influence of the formed strategic alliance on the satisfaction of the *l*-th group of stakeholders to the organization, the degree of influence of the formed strategic alliance on the change of power between the *l*-th group of stakeholders and the organization.

We will consider the following fuzzy variables in the model:

1) the quantitative assessment of the expectations of the *l*-th group of stakeholders regarding the organization (O_1^l) and the quantitative assessment of the expectations of the organization regarding the *l*-th group of stakeholders (O_2^l) (in this model, there are no changes in the expectations of stakeholders regarding the organization as a result of the latter joining the strategic alliance, although such changes are possible);

2) the degree of mutual influence of the organization and the *l*-th group of stakeholders before the formation of the strategic alliance (V^l) and the degree of mutual influence of the organization and the *l*-th group of stakeholders after the formation of the strategic alliance ($\widehat{V^l}$);

3) the degree of the *l*-th group's of stakeholders satisfaction with the organization before the formation of the strategic alliance (U_1^l) and the degree of the *l*-th group's of stakeholders satisfaction with the organization after the formation of the strategic alliance ($\widehat{U_1^l}$) ($l = \overline{1,L}$);

4) the degree of the organization's satisfaction with the *l*-th group of stakeholders (U_2^l);

5) the degree of influence of the formed strategic alliance on the satisfaction of the *l*-th group of stakeholders to the organization (k^l) and the degree of influence of the formed strategic alliance on the change of power between the *l*-th group of stakeholders and the organization (r^l);

6) the degree of strength (stability) of the formed alliance between organizations (s) [17];

7) the expediency of applying the *n*-th type interaction strategy with respect to the *l*-th group of stakeholders (w_n^l) ($n = \overline{1,5}$).

The term sets of linguistic variables "degree of satisfaction", "quantitative assessment of expectations" and "degree of mutual influence" were described in the paper [15]. The term sets of other linguistic variables are presented in Tables 1 and 2.

Table 1. Term set of the linguistic variables "degree of influence of the formed strategic alliance on the change of satisfaction", "degree of influence of the formed strategic alliance on the change of power", "expediency of applying the type interaction strategy".

Value of the linguistic variable	Trapezoidal membership function
Large (H)	(0.7; 0.8; 1; 1)
Above average (MH)	(0.5; 0.6; 0.8; 0.9)
Average (M)	(0.3; 0.4; 0.6; 0.7)
Below average (ML)	(0.1; 0.2; 0.4; 0.5)
Small (L)	(0; 0.1; 0.2; 0.3)
Extremely small (LL)	(0; 0; 0.1; 0.15)

Table 2. Term set of the linguistic variable "degree of strength (stability) of alliance".

Value of the linguistic variable	Trapezoidal membership function
Very large (HH)	(3.5; 4.25; 5; 5)
Large (H)	(2.75; 3.5; 4.25; 5)
Above average (MH)	(2; 2.75; 3.5; 4.25)
Average (M)	(1.5; 2.25; 2.75; 3.5)
Below average (ML)	(0.75; 1.5; 2.25; 3)
Small (L)	(0; 0.75; 1.5; 2.25)
Extremely small probability (LL)	(0; 0; 0.75; 1.5)

We will consider ($\widehat{U_1^l}$) as a function depending on U_1^l, S and k^l. Table 3 shows a fragment of the fuzzy rule base for assessment of $\widehat{U_1^l}$. The total number of rules is 294.

We will consider $\widehat{V^l}$ as a function depending on V^l, S and r^l. A similar fuzzy rule base for assessment of $\widehat{V^l}$ can be specified.

Table 3. Fragment of the fuzzy rule base for assessment of $\widehat{U_1^l}$.

Fuzzy rule number	IF			THEN
	k^l	S	U_1^l	$\widehat{U_1^l}$
1	H	HH	HH	HH
8	H	H	HH	HH
19	H	MH	ML	MH
55	MH	HH	L	M
86	MH	L	H	HH
126	M	M	LL	L
150	ML	HH	MH	H
230	L	ML	L	L
294	LL	LL	LL	LL

In general, it is possible to describe the following algorithm of using the fuzzy model for choosing strategies for the organization's interaction with stakeholders in a network with multiple "power centers". At the first stage, fuzzy characteristics of the relationship between the organization and stakeholders (degree of satisfaction, quantitative assessment of expectations, degree of mutual influence) are assessed before the formation of the strategic alliance. Then, using the fuzzy rule base, the expediency of applying the organization's strategies of interaction with stakeholders (satisfaction of requests, protection, impact, cooperation, restraint) is assessed before the formation of the strategic alliance based on five input factors (this fuzzy rule base is described in detail in the paper [15]). After that, the fuzzy characteristics of the strategic alliance are assessed (the degree of influence of the formed strategic alliance on the change in satisfaction, the degree of influence of the formed strategic alliance on the change in the degree of mutual influence, the degree of strength of the alliance). At the next stage, $\widehat{U_1^l}$ and $\widehat{V^l}$ are assessed using the fuzzy rule base. Then, the expediency of applying the organization's strategies of interaction with stakeholder groups after the formation of the strategic alliance is assessed using the fuzzy rule base. At the last stage, the analysis of the results is carried out. The model makes it possible to determine for which stakeholders, as a result of the formation of a strategic alliance, it is advisable to change the type of interaction strategy.

Figure 1 shows the algorithm for choosing a type of strategy for interaction with stakeholders of an organization that has joined a strategic alliance.

1. Assessment of the fuzzy characteristics of the relationship between the organization and stakeholders before the formation of the strategic alliance

2. Assessment of the expediency of applying types of strategies for interaction of the organization with stakeholders before the formation of the strategic alliance

3. Assessment of the fuzzy characteristics of the strategic alliance

4. Assessment of the fuzzy characteristics of relationships between the organization and stakeholders after the formation of the strategic alliance

5. Assessment of the expediency of applying types of strategies for interaction of the organization with stakeholders after the formation of the strategic alliance

6. Selection of types of strategies for interaction between the organization and stakeholders
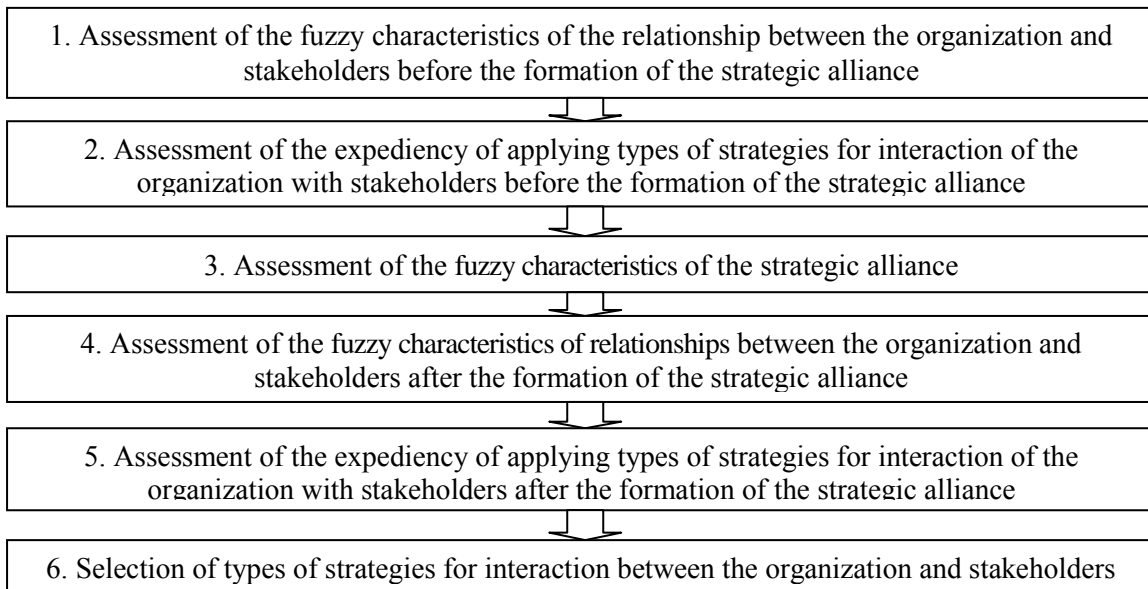
Figure 1. The algorithm for choosing a type of strategy for interaction with stakeholders of an organization that has joined a strategic alliance.

It should be noted that the assessment of the characteristics of the relationship can be made based on individual resources exchanged by stakeholders with the organization. In this case, it is necessary to take into account the weights of the resources, which will reflect the significance of each resource for the organization or stakeholder.

3. Conclusion

A fuzzy model has been developed in this study to choose strategies for interaction with stakeholders of an organization in a strategic alliance. The model allows assessing the impact of strategic alliances on the change of the characteristics of the relationship between an organization and stakeholder groups. Determination of the most expedient types of strategies for interaction between an organization and stakeholders is based on the fuzzy inference rule base. This takes into account both changes in the characteristics of the relationship between stakeholders and an organization and the characteristics of an alliance. Both groups of characteristics are not clearly defined in the model. It is shown that the assessment of the characteristics of relationships can be made for individual resource components included in the resource exchange between an organization and stakeholders. It is planned to develop a modification of this model in the future to take into account changes in stakeholder expectations regarding an organization as a result of its entry into a strategic alliance.

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