

## **PARTNER CHOICE MULTI-CRITERIA MODEL AT THE STRATEGIC BUSINESS ALLIANCES FORMING**

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**Abstract.** *The article contains the authors' understanding of the concept of strategic alliance. The main areas and directions of potential cooperation between partner enterprises are identified. Sources of synergy in such cooperation are generalized. By means of multi-criteria optimization tools (the analytic hierarchy process and TOPSIS), using the concept of potential synergies based on the model of strategic interaction, the model of choosing partners to create strategic business alliances is developed.*

**Keywords** *strategic business alliances; strategic interaction; multi-criteria analysis; Analytic Hierarchy Process (AHP); TOPSIS.*

**JEL classification:** *M16*

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### **1. Introduction**

Increased globalization, the shift of emphasis from material and financial resources towards intellectual and knowledge assets, a fundamental transformation of traditional models and mechanisms of enterprising in a competitive environment, transformation of the nature of the competition necessitate the solving of the problem to introduce new forms of economic interests realization to companies and firms. More often the integration is increasingly seen as one of the key trends in the business conducting. The

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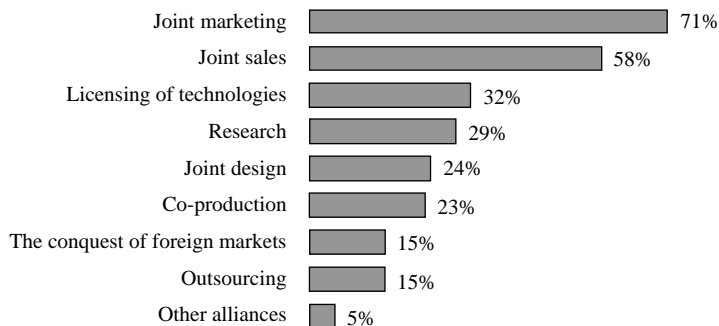
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usage of integration forms encourages its members to keep a constant search for the most effective forms of cooperation. There appears the necessity to use such forms of organizational integration that would possess the most flexibility and meet modern realities. Such forms are the strategic alliances that are considered as one of the fundamentals of global economy development. In support of the above words Carlos Slim Helú, one of the world's richest people, the owner of Grupo Carso holding company, which controls a number of large Mexican companies, stated that 'in this era of rapid development of technology you cannot do everything yourself. You must build alliances'.

Today, each of the 500 largest companies in the world participates in 60 alliances on the average. According Trendsetter Barometer, PwC in the US on average each fast-growing firm is involved in the strategic alliances of five different types, and the overall statistics is following (Figure 1).

**Figure 1: Participation of fast-growing companies in the US in strategic alliances**



Source: Adapted from Trendsetter Barometer, PwC

## **2. Literature review**

The great number of works is dedicated to strategic alliances research in modern economic science. Approaches and emphasis in researches have been changed. In the 80s and the 90s of the last century there was focus on understanding the nature of strategic alliances, characteristics of their manifestation in different sectors. Since the early 2000s, the analysis is shifting towards fundamental studies of strategic alliances and prospects of

their development. Among the works of famous authors can be identified approaches of B. Garrette, P. Dussauge, G. Blanc, W. Mitchell, R. Lynch, S. Urban, S. Vendemini, R. Wallace, A. Campbell, K. Sommers Luchs, M. Porter, I. Ansoff etc.

It should be noted that many of the theoretical and practical aspects of the establishment and operation of strategic alliances are so far not sufficiently developed. There are particular differences in understanding the essence of the concept of a strategic alliance (Hoshovs'ka et al., 2011). So some researchers link the strategic nature of the alliance with its value for participants. Others believe that the strategic alliance is in this way the interaction of competitors that has to change the nature and structure of the economic game in the whole sector or industry by significant strengthening the market position of the allies, neutralize competitors or strengthen competitive position for suppliers. Thus, from this point of view, the strategic alliances can be considered only if the participants of alliance are prominent enterprises of the sector, and their performance has an influence not only on them but also on the whole sector or even the whole economy.

Petrov (2005) considers a strategic alliance as a coalition of two or more enterprises (organizations), created to achieve strategically significant goals that are mutually beneficial to them. The criteria that are essential for the formation of strategic alliances, in his opinion, are:

- strategically important targets of activities;
- opportunity to gain mutual (but not necessarily equal) benefits for the participants;
- the possibility of getting such benefits that cannot be obtained any other way.

Dussauge and Garrette (1991) believe that strategic alliances are agreements between several independent companies that jointly decide to implement project or specific activities, coordinating competencies, methods and resources required for such activities.

Yoshino and Rangana (1995) are in favor of a broad interpretation of the concept of strategic alliances. According to their definition, a strategic alliance – an alliance between two or more companies that declare a common and consistent goal conserving organizational independence and sharing the gained benefits among themselves, moreover, jointly control alliance and also contribute in the form of technology, product information, market access, etc.

In our view, the definition of Blank and his colleagues (Blank et al., 1991) can be considered as the sufficiently complete: strategic alliances – are different forms of cooperation among existing or potential competitors, who decided to carry out a project or activity altogether, combining and coordinating their resources, tools and skills. This definition limits the cases of competitors cooperation, excluding other corporate agreements that do not contain any elements of rivalry, is open and covers every form of partnership, even the informal one if it takes a precondition.

From Hunga's perspective (1993), a strategic alliance is a long-term cooperative agreement between two or more enterprises to merge, exchange and/or integrates specific resources of partners to reach the selected goal. This approach includes a wide range of agreements between partners: starting from supplier-recipient agreements until the full mergers. While cooperative projects cover activities as the joint venture, the exchange of licenses, bilateral agreements on distribution and promotion, technology transfer, agreement on the exchange of information, common research program developments, joint service. This type of alliances should include: the purpose of the partnership; long-term agreement, which indicates the length of cooperation; clear and identifiable contributions of partners; active participation and cooperation between partners in the management of the alliance.

Jason Wakeam (Director, Operations, Global Alliances, Hewlett-Packard Company, Palo Alto, California) argues that there are five general criteria that differentiate strategic alliances from conventional alliances (Wakeam, 2003):

1. Critical to the success of a core business goal or objective.
2. Critical to the development or maintenance of a core competency or other source of competitive advantage.
3. Blocks a competitive threat.
4. Creates or maintains strategic choices for the firm.
5. Mitigates a significant risk to the business.

We believe that the strategic business alliance (SBA) – an association of two or more partner companies, based on the use of potential synergies in their strategic cooperation in certain areas, allows them to eliminate gaps in their own value chain and strengthen the existing or obtained competitive advantages in the market.

One of the main reasons of the strategic alliance is to obtain a synergistic effect. Ansoff (1981) considers this phenomenon as a metric of joint effects

when enterprises interacting. An important aspect of the study of synergy in the integration of companies is a question of possible sources of such effects identifying. Ansoff, describing the appearance of synergistic effects arising from the integration of businesses, isolates:

a) sales synergy arising from the benefits of the organization in terms of marketing, advertising, joint distribution;

b) productive synergy that leads to maximum capacity utilization, reducing costs of procurement overhead costs to the economy;

c) investment synergy as a multiplier effect of investment opportunities usage of each firm;

d) management synergy resulting from the increase in human resources, as increasing training opportunities, experiences exchange, internal rotation of staff and so on.

Gaughan (2011) proposes to identify the source of synergy when combining the enterprises by analyzing the similarities and complementary characteristics of their external and internal environments. In particular, among the major sources of synergy in the external environment he allocates the possibility of using comparative advantages of different markets; risk sharing through activities in different markets; growth potential use of less mature market; the benefits of entering a new market with low presence of competition; leveling of production workload of a company that operates in the market with low and unstable demand during the year due to stable demand on the market of a partner. Sources of synergy in the internal environment of an organization can be: scale effects and by vertical integration of production, cost reduction by avoiding transfer pricing; transfer of knowledge and experience in activities, sharing of joint values, existing practices of promotion and marketing, usage of partner's brand in the marketing of products; benefits from access to cheaper or rare resources; creating new vacancies, scale-up by capacity combining, etc.

Wells (1984) provides such types of synergy achieved in the process of diversification of the organization: financial synergy, which involves costs reducing by avoiding transfer pricing, lower cost of capital due to diversification of risk, and stock profitability increasing through the financial market imperfections; saving expansion that is due to the common use of resources; enhanced market power, namely mutual support and funding various activities, blocking the actions of competitors and suppliers; operating

synergy that involves sharing the functional units of organizations, as well as knowledge and experience in management.

Campbell and Sommers Luchs (1998) distinguish the following main areas of synergy realization: the sharing of know-how, which involves the transfer of experience and skills; results of operation of the organization's divisions can be improved when combining their efforts to improve the individual processes of production functions and market research; shared knowledge and experience can be formally documented in the company, or can spread informally; sharing of material resources (production facilities, research laboratories, etc.) allows to achieve economies of scale and avoid duplication of work; enhancing of the impact on the environment, such as suppliers, customers, government, social agencies. Last mentioned is a source of many benefits for the company: lower prices for materials purchasing, improvement of the quality, improvement of the supply conditions, improvement of the finished product, ensuring more favorable climate for business activity and many others. Coordination of strategies allows, in particular, avoiding competition between business units. It is quite difficult to achieve this type of synergy as difficult to maintain a balance between the degree of intervention of senior management in the work units and autonomy of units.

Thus, the major synergistic benefits that must be borne in mind when choosing strategic alliances are:

- access to channels of marketing and sales of a partner and its position in the market;
- access to products, technologies and intellectual property of a partner;
- access to financial resources of a partner;
- new markets for products and new products to customers;
- strengthening the brand in the market through channels of a partner;
- accelerating the development of new products and entry into market with it;
- reducing the cost and risk of R&D and the creation of radically innovative technologies;
- rapid achievement of critical mass and scale required;
- establishment of technology standards in the industry and production of the first products that meet these standards;
- by-products disposal;
- access to professional knowledge and managerial skills.

### **3. Methodology and research questions**

Numerous studies show that currently about 60% of alliances does not justify expectations at the beginning of the activity or revise previously agreed objectives of the activity. One of their main problem or often the cause of a decay is the quality of alliance partners together with the size of the alliance, internal competition and complexity of management (Shipilov, 2006). That is why the choice of partners has to be done very carefully and pragmatically. They have to complement opportunities of each other. The result of well-chosen members of the alliance was, for example, the version of the PDA (Personal Digital Assistant), developed by the alliance chaired by Apple. In this case several successful developments jointed together: computer communications, communication capabilities of mobile phones, size and style of electronics. One company could not make it all as well. Because Apple has offered technology, Advanced Risk Machines – chips and Sharp – design. Apple has provided its sales network.

Experts warn which alliance partners better to avoid. In general, you should avoid fake and treacherous partners undemanding and those seeking to win at any cost. As a potential strategic alliance partner cannot be regarded a company (Petrov, 2005) that

1) occupies a weak competitive position, does not have significant resources for competitive advantages, that cannot make an appropriate contribution to the alliance;

2) considers strategic alliance as a kind of means the acquisition of production skills and abilities from its partners, that only takes over the experience and skills of its partners, and not tries to make own contribution to the alliance to achieve new strengths and skills;

3) seeks opportunities only for their own competitive advantage in the market and will use the alliance to the detriment of its partners;

4) will not be willing to follow clear agreement on cooperation;

5) does not share approach to the operation of the alliance's expected results;

6) has exaggerated ideas about its image and opportunities.

Note also that a strategic alliance is inappropriate to create between firms having different goals of its operation and various types of organizational culture that will significantly complicate the formation of a

single system of the alliance. The entry into the alliance companies, managed by the family, rather than by professional managers, can also be dangerous.

There is an interesting, but rather subjective and not without shortcomings, approach (LLIFT) to the evaluation of possible business partners in a strategic alliance according the criteria: **L**ikeability, **L**ongevity, **I**nterest or Incentive, **F**inancial Muscle and Commitment, **T**imeline, which was proposed by Wallace (2004).

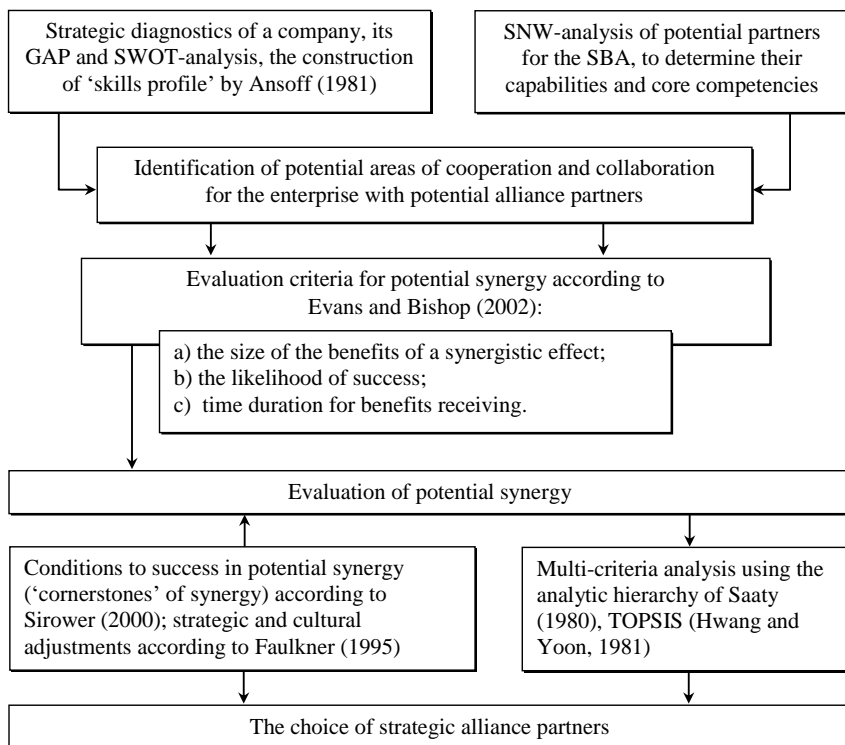
We developed a model of to choice partners to form strategic business alliance that allows one to solve a number of problems with future viability and effectiveness of the SBA created and reduce the likelihood of its destruction in the future (Figure 2).

In the model the potential synergy in creating strategic business alliances is understood as the totality of sources, means and opportunities for synergy realization arising from the partnership and strategic interaction between enterprises in different fields.

Figure 3 represents a technique developed by the authors according to the proposed model that allows solving a number of procedural issues related to the preparation of decisions on the choice of partner companies to create strategic business alliances. It involves the following sequence of steps.



**Figure 2: Basic elements of the model of partners choice for strategic business alliance**



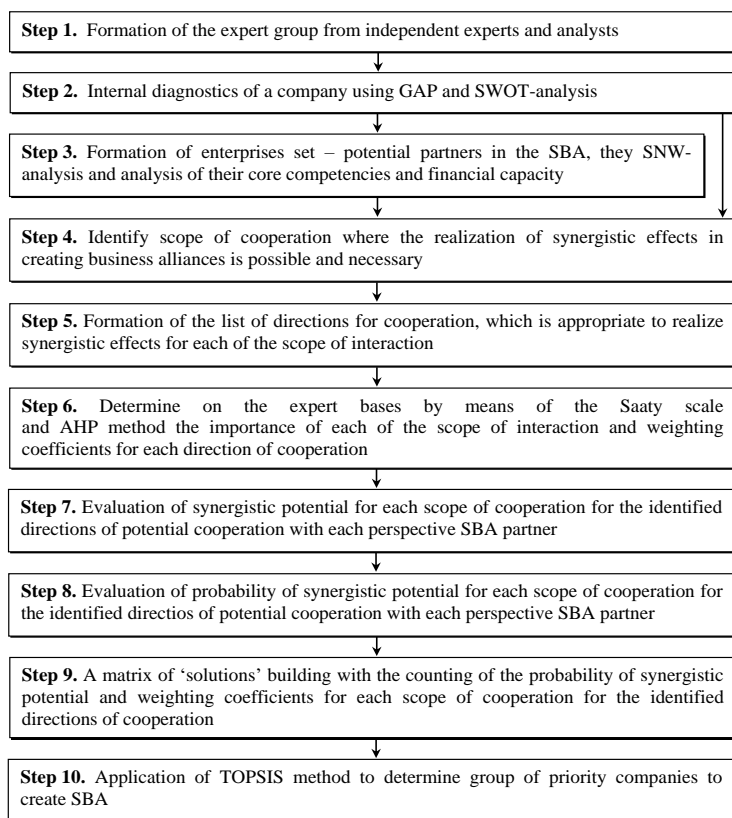
Source: Authors' development

According to the proposed model at the **1st step** we form an expert group of analysts and experts, selected on the basis of problem-oriented (focus on theoretical and practical aspects of strategic analysis and creation of businesses SBA, knowledge of business logic and logical causality in the sector, 7–9 pers.). The expert 'core' should include representatives from senior management and functional managers, while specialized experts (by interaction and collaboration) can be leaders, experts of various functional areas of the company.

**Step 2** is to conduct a strategic diagnostics of an enterprise using GAP and SWOT-analysis in order to identify and recognize own competence, skills

and abilities, and, most importantly, own weaknesses, gaps and shortcomings. Numerous studies of theorists and practitioners indicate that most companies underestimate the importance of substantiation own set of competencies and skills to create potentially new products.

**Figure 3: Method of selecting partners in strategic business alliance**



Source: Authors' development

**Step 3** exercises preliminary selection of companies that can be of interest for the company in view of the results of the 1st stage. After careful SNW-analysis, analysis of their core competencies and financial capacity we form a set of companies – potential partners in the SBA. We establish initial

contacts with them and lead preliminary negotiations, critically assessing future costs and benefits that will arise from the future of the alliance.

Further the use of the proposed methods we illustrate as an example of the search of potential partners to create strategic business alliances for Ukrainian companies working in the confectionery industry.

**Step 4** involves on the basis of Step 2 the identification of the desired scopes of interaction between our firm and potential partners in the SBA:  $IS^{(1)}$ ,  $IS^{(2)}$ , ...,  $IS^{(m)}$  (Table 1).

**Step 5**, taking into account the results of Step 2 the experts of the enterprise should allocate for each scope of interaction desired directions of cooperation (Table 1):  $IS_j^{(k)}$  ( $k = 1, \dots, m; j = 1, \dots, N_k$ ):

$$IS^{(1)} \rightarrow (IS_1^{(1)}, \dots, IS_{N_1}^{(1)}); IS^{(2)} \rightarrow (IS_1^{(2)}, \dots, C_{N_2}^{(2)}); \dots;$$

$$IS^{(m)} \rightarrow (IS_1^{(m)}, \dots, IS_{N_m}^{(m)}).$$

**Table 1: Preferred scopes of cooperation and directions of cooperation for the enterprise with potential partners for the SBA**

<i>Scope of strategic cooperation</i>	<i>Notes</i>	<i>Directions of Cooperation</i>	<i>Symbol</i>
<b>Organizational and management cooperation</b>	$IS^{(1)}$	Training	$IS_1^{(1)}$
		Staffing	$IS_2^{(1)}$
		Technologies of management	$IS_3^{(1)}$
		Optimization of organizational structure	$IS_4^{(1)}$
		Strategic flexibility	$IS_5^{(1)}$
<b>Marketing cooperation</b>	$IS^{(2)}$	Transport logistics	$IS_1^{(2)}$
		Warehousing	$IS_2^{(2)}$
		Retailers	$IS_3^{(2)}$
		Expansion of the product range	$IS_4^{(2)}$

		Expansion of markets	$IS_5^{(2)}$
		The level of product quality	$IS_6^{(2)}$
		Contacts with intermediaries	$IS_7^{(2)}$
		After sales service	$IS_8^{(2)}$
		Brands	$IS_9^{(2)}$
		Marketing research	$IS_{10}^{(2)}$
<b>Cooperation in the field of technology</b>	$IS^{(3)}$	Joint research and development	$IS_1^{(3)}$
		Technology transfer	$IS_2^{(3)}$
		Development of new technology standards	$IS_3^{(3)}$
		Preparation of specialists	$IS_4^{(3)}$
<b>Financial and investment cooperation</b>	$IS^{(4)}$	Stabilization of earnings	$IS_1^{(4)}$
		Access to finance	$IS_2^{(4)}$
		Risk-sharing	$IS_3^{(4)}$
		Financial and accounting support	$IS_4^{(4)}$
<b>Industrial cooperation</b>	$IS^{(5)}$	Optimization of business processes	$IS_1^{(5)}$
		Providing raw materials	$IS_2^{(5)}$
		Reduction of production costs	$IS_3^{(5)}$
		Supply of modern equipment	$IS_4^{(5)}$
<b>Cooperation in the sphere of information</b>	$IS^{(6)}$	Access to customers databases	$IS_1^{(6)}$
		Access to relevant information on the market	$IS_2^{(6)}$
		Establishing effective communication	$IS_3^{(6)}$
		Optimization of information flows	$IS_4^{(6)}$

<b>Socio-cultural cooperation</b>	$IS^{(7)}$	Formation of corporate values	$IS_1^{(7)}$
		Establishing contacts with society	$IS_2^{(7)}$
		Adapting the organizational culture to the specific environment	$IS_3^{(7)}$
<b>Co-operation in policy-legal sphere</b>	$IS^{(8)}$	Legal and advisory providing	$IS_1^{(8)}$
		Legal Due Diligence	$IS_2^{(8)}$
		Minimizing of political risks	$IS_3^{(8)}$
<b>Cooperation in the environmental field</b>	$IS^{(9)}$	Minimizing environmental pollution	$IS_1^{(9)}$
		Projects to recycle products	$IS_2^{(9)}$
		The use of environmentally friendly raw materials	$IS_3^{(9)}$

**Step 6** using a Saaty (1980) scale of relative advantages and expert reasoning on the importance of each scope of interaction compared to other we build a matrix of paired comparisons  $A = \|a_{ij}\|_{m \times m}$ , where  $a_{ij}$  is an expert assessment of the relative dominance  $IS^{(i)}$  in comparison to  $IS^{(j)}$ , as well  $a_{ji} = 1/a_{ij}$  for  $i, j = 1, 2, \dots, m$ .

$$A = \left\| a_{ij} \right\|_{m \times m} = \begin{pmatrix} & IS^{(1)} & IS^{(2)} & IS^{(3)} & IS^{(4)} & IS^{(5)} & IS^{(6)} & IS^{(7)} & IS^{(8)} & IS^{(9)} \\ IS^{(1)} & 1 & 1/2 & 1 & 2 & 1 & 3 & 4 & 4 & 5 \\ IS^{(2)} & 2 & 1 & 2 & 3 & 2 & 4 & 6 & 6 & 8 \\ IS^{(3)} & 1 & 1/2 & 1 & 2 & 1 & 3 & 4 & 4 & 5 \\ IS^{(4)} & 1/2 & 1/3 & 1/2 & 1 & 1/2 & 1 & 2 & 2 & 3 \\ IS^{(5)} & 1 & 1/2 & 1 & 2 & 1 & 3 & 4 & 4 & 5 \\ IS^{(6)} & 1/3 & 1/4 & 1/3 & 1 & 1/3 & 1 & 2 & 2 & 2 \\ IS^{(7)} & 1/4 & 1/6 & 1/4 & 1/2 & 1/4 & 1/2 & 1 & 1 & 2 \\ IS^{(8)} & 1/4 & 1/6 & 1/4 & 1/2 & 1/4 & 1/2 & 1 & 1 & 2 \\ IS^{(9)} & 1/5 & 1/8 & 1/5 & 1/3 & 1/5 & 1/2 & 1/2 & 1/2 & 1 \end{pmatrix}$$

Weights  $W_i$  of scopes of cooperation  $IS^{(i)}$  ( $i = 1, 2, \dots, m$ ) are the eigen values of matrix  $A$ , but they can be approximately calculated by the formula  $W_i = \frac{\sqrt[m]{a_{i1} \cdot a_{i2} \cdot \dots \cdot a_{im}}}{\sum_{k=1}^m \sqrt[m]{a_{k1} \cdot a_{k2} \cdot \dots \cdot a_{km}}}$ ,  $i = 1, 2, \dots, m$  (T. Saaty):

$$W_1 = 0.159; W_2 = 0.269; W_3 = 0.159; W_4 = 0.080; W_5 = 0.159; \\ W_6 = 0.065; W_7 = 0.041; W_8 = 0.041; W_9 = 0.028.$$

To determine the importance of each of scope of cooperation in certain direction of interaction, you can use a similar procedure on the basis of the scale comparisons and Saaty method or using direct experts. As a result, we obtain  $w_j^{(k)}$  – weights  $j$ -s scope of cooperation  $k$ -s direction of interaction

$$(k = 1, 2, \dots, m; j = 1, 2, \dots, N_k) \text{ (beside } \sum_{j=1}^{N_k} w_j^{(k)} = 1):$$

$$w_1^{(1)}, w_2^{(1)}, \dots, w_{N_1}^{(1)}; w_1^{(2)}, w_2^{(2)}, \dots, w_{N_2}^{(2)}; \dots; w_1^{(m)}, w_2^{(m)}, \dots, w_{N_m}^{(m)}.$$

**Step 7 and 8** provide adequate evaluation of potential synergy and the probability of realization of synergistic effects as to every scope of

cooperation in the identified directions of potential cooperation with each partner SBA (Table 2).

**Table 2: Matrix evaluation of potential synergy in strategic cooperation with companies – potential partners to create SBA**

		Strategic cooperation											
Scope of cooperation	$IS^{(1)}$				$IS^{(2)}$				...	$IS^{(m)}$			
	$IS_1^{(1)}$	$IS_2^{(1)}$	...	$IS_{N_1}^{(1)}$	$IS_1^{(2)}$	$IS_2^{(2)}$	...	$IS_{N_2}^{(2)}$	...	$IS_1^{(m)}$	$IS_2^{(m)}$	...	$IS_{N_m}^{(m)}$
Directions of Cooperation													
The weights for directions of cooperation	$w_1^{(1)}$	$w_2^{(1)}$	...	$w_{N_1}^{(1)}$	$w_1^{(2)}$	$w_2^{(2)}$	...	$w_{N_2}^{(2)}$	...	$w_1^{(m)}$	$w_2^{(m)}$	...	$w_{N_m}^{(m)}$
Expert assessments of potential synergy in scope of cooperation													
company $C_1$	$s_{11}^{(1)}$	$s_{12}^{(1)}$	...	$s_{1N_1}^{(1)}$	$s_{11}^{(2)}$	$s_{12}^{(2)}$	...	$s_{1N_2}^{(2)}$	...	$s_{11}^{(m)}$	$s_{12}^{(m)}$	...	$s_{1N_m}^{(m)}$
company $C_2$	$s_{21}^{(1)}$	$s_{22}^{(1)}$	...	$s_{2N_1}^{(1)}$	$s_{21}^{(2)}$	$s_{22}^{(2)}$	...	$s_{2N_2}^{(2)}$	...	$s_{21}^{(m)}$	$s_{22}^{(m)}$	...	$s_{2N_m}^{(m)}$
...	⋮	⋮	...	⋮	⋮	⋮	...	⋮	...	⋮	⋮	...	⋮

$C_n$ company	$s_{n1}^{(1)}$	$s_{n2}^{(1)}$	...	$s_{nN_1}^{(1)}$	$s_{n1}^{(2)}$	$s_{n2}^{(2)}$	...	$s_{nN_2}^{(2)}$	...	$s_{n1}^{(m)}$	$s_{n2}^{(m)}$	...	$s_{nN_m}^{(m)}$

Table 2 contains  $p_{ij}^{(k)}$  indicated the likelihood of potential synergy between investigated and  $i$ -th company for  $j$ -th type of cooperation  $k$ -th direction of interaction;  $s_{ij}^{(k)}$  – expert value (10-point scale) of potential synergy between our and  $i$ -th company for  $j$ -th type of cooperation  $k$ -th direction of interaction ( $k = 1, 2, \dots, m$ ;  $j = 1, 2, \dots, N_k$ ,  $i = 1, 2, \dots, n$ ).

**Step 9** taking into account the probability of potential synergy and weighting coefficients for each scope of cooperation for the identified directions of interaction we calculate integral estimates of potential synergy for the investigated enterprise with  $i$ -th company for  $k$ -th scope of interaction

according the formula:  $SP_i^{(k)} = \sum_{j=1}^{N_k} w_j^{(k)} \cdot p_{ij}^{(k)} \cdot s_{ij}^{(k)}$  and build a matrix (a

matrix of integral values of potential synergy)  $D = \|r_{ik}\|_{n \times m} = SP_i^{(k)}$ .

Because of the awkwardness of the calculations we present already computed integral values of potential synergy for certain scope of interaction for the investigated enterprise with all possible partners-companies to create SBA (Table 3).

**Table 3: Matrix of integral values of potential synergy for certain scope of interaction**

$D$	$IS^{(1)}$	$IS^{(2)}$	$IS^{(3)}$	$IS^{(4)}$	$IS^{(5)}$	$IS^{(6)}$	$IS^{(7)}$	$IS^{(8)}$	$IS^{(9)}$
$C_1$	4.75	4.31	4.41	4.75	3.55	4.83	4.13	5.30	4.80
$C_2$	4.91	4.24	2.68	4.83	5.25	4.01	5.09	4.38	5.34
$C_3$	3.91	3.10	5.01	4.27	4.40	3.74	3.69	3.46	4.41
$C_4$	3.56	3.76	3.87	4.56	3.53	3.53	4.49	4.57	5.79



$C_5$	3.05	4.64	4.48	4.91	3.31	4.10	4.60	4.37	5.42
$C_6$	4.34	4.30	4.95	4.40	5.28	4.35	5.02	3.79	5.02
$C_7$	4.42	3.87	5.09	4.26	4.38	3.48	4.02	4.29	4.94
$C_8$	3.87	3.65	4.61	3.27	5.29	4.38	4.76	3.28	4.27
$C_9$	4.54	4.77	2.56	4.28	3.96	2.91	5.64	4.45	4.53
$C_{10}$	4.60	4.53	5.93	5.83	4.58	3.99	3.61	4.85	4.90

**Step 10.** To determine the priority group of companies to create strategic alliances we can use TOPSIS (Hwang and Yoon,1981). Next steps should be done:

**Step 10.1.** Normalization of solutions matrix. This step of TOPSIS in this case we cannot perform because all ratings were made in points at the 7th stage (a 10-point scale).

**Step 10.2.** Construction of the weighted decision matrix  $U = \|u_{ij}\|_{n \times m}$ . The matrix of integral values of potential synergy  $D = \|r_{ij}\|_{n \times m}$  is applied by specified weights ( $W_1, W_2, \dots, W_m$ ):  $\sum_{j=1}^m W_j = 1$ . Matrix  $U = \|u_{ij}\|_{n \times m}$  is obtained by multiplying each column of the matrix of integral values of potential synergy by the assigned weight  $W_j$ :  $u_{ij} = W_j \times r_{ij}$  (Table 4) ( $i = 1, 2, \dots, n$ ;  $j = 1, 2, \dots, m$ ).

**Table 4: ‘Weighted’ matrix of solutions**

$U$	$IS^{(1)}$	$IS^{(2)}$	$IS^{(3)}$	$IS^{(4)}$	$IS^{(5)}$	$IS^{(6)}$	$IS^{(7)}$	$IS^{(8)}$	$IS^{(9)}$
$C_1$	0.754	1.159	0.700	0.380	0.563	0.312	0.170	0.219	0.135
$C_2$	0.779	1.140	0.425	0.386	0.833	0.259	0.210	0.181	0.150
$C_3$	0.620	0.833	0.795	0.341	0.698	0.242	0.152	0.143	0.124
$C_4$	0.565	1.011	0.614	0.364	0.560	0.228	0.185	0.189	0.163

$C_5$	0.484	1.247	0.711	0.392	0.525	0.265	0.190	0.180	0.153
$C_6$	0.689	1.156	0.785	0.352	0.838	0.281	0.207	0.156	0.141
$C_7$	0.701	1.040	0.808	0.340	0.695	0.225	0.166	0.177	0.139
$C_8$	0.614	0.981	0.731	0.261	0.839	0.283	0.196	0.135	0.120
$C_9$	0.720	1.282	0.406	0.342	0.628	0.188	0.233	0.184	0.127
$C_{10}$	0.730	1.218	0.941	0.466	0.727	0.258	0.149	0.200	0.138

**Step 10.3.** Definition of ‘perfect positive’ and ‘perfect negative’ solutions. Define two artificial alternatives  $C^+$  and  $C^-$  as following:

$$C^+ = \{\max_i u_{ij}, i = 1, 2, \dots, n\} = \{u_1^+, u_2^+, \dots, u_m^+\},$$

$$C^- = \{\min_i u_{ij}, i = 1, 2, \dots, n\} = \{u_1^-, u_2^-, \dots, u_m^-\}.$$

In our case  $C^+ = (0.779; 1.282; 0.941; 0.466; 0.839; 0.312; 0.233)$ ;  
 $C^- = (0.484; 0.833; 0.406; 0.261; 0.525; 0.188; 0.149)$ .

**Step 10.4.** Calculating the degree of proximity to the ‘perfect’ alternatives. The distance from one alternative to another can be calculated using formulas that define the n-dimensional Euclidean distance. Thus, the distance between the i-th alternative and ‘perfect positive’ is calculated by the

formula:  $S_i^+ = \sqrt{\sum_{j=1}^m (u_{ij} - u_j^+)^2}$ ,  $i = 1, 2, \dots, n$ . Similarly, the distance to the

‘perfect negative’ decision:  $S_i^- = \sqrt{\sum_{j=1}^m (u_{ij} - u_j^-)^2}$ ,  $i = 1, 2, \dots, n$ .

**Step 10.5.** Calculation of the relative closeness to the perfect solution.

The relative proximity  $R_i$  to  $C^+$  is determined as  $R_i = \frac{S_i^-}{S_i^- + S_i^+}$ ,

$0 < R_i < 1$ ,  $i = 1, 2, \dots, n$ . It is obvious that that more the value, more ‘preferred’ alternative is.

Results of calculations  $S_i^+$ ,  $S_i^-$  and  $R_i$  are represented in Table 5.

**Table 5: Calculated  $S^+$ ,  $S^-$ ,  $R$  and ranks for companies – potential partners SBA**

	$S^+$	$S^-$	$R$	Rank
$C_1$	0.403	0.551	0.577	4
$C_2$	0.545	0.551	0.502	7
$C_3$	0.550	0.457	0.454	9
$C_4$	0.570	0.317	0.358	10
$C_5$	0.501	0.540	0.519	6
$C_6$	0.260	0.639	0.711	2
$C_7$	0.365	0.539	0.596	3
$C_8$	0.463	0.505	0.521	5
$C_9$	0.606	0.533	0.468	8
$C_{10}$	0.174	0.766	0.815	1

#### 4. Results

Ranking of companies by index of relative proximity  $R$  allows to conclude that the most advantageous for the investigated enterprise to establish strategic alliance are companies  $C_{10}$  and  $C_6$ , which have highest  $R$ . The next group consists of the company  $C_7$ ,  $C_1$ . The final choice of strategic alliance partners shall be done according to the ‘cornerstones of synergy’ developed by New York University professor Sirower (2000), which can be regarded as a necessary condition for success in synergy, strategic vision, operational strategy, systems integration, power and culture. According to another scientist, Faulkner (1995), the success of each alliance, and especially international, depends on the simultaneous consideration of two factors – strategic and cultural adjustment. D. Faulkner understands strategic adaptation

as the complementation of resources and competencies of partners, which creates conditions for a strong synergistic effect if they cooperate. It also assumes that partners have similar strategic goals and not too different in size. The concept of 'strategic adjustment' covers simultaneously multiple conditions of transactional logic of the alliance, symmetry of partners and common strategic objective. Cultural adaptations according to D. Faulkner are defined as the ability of alliance partners to interact with each other despite cultural differences, mutual trust and openness. Cultural differences provide an opportunity to learn, develop and increase the synergistic effect which would not arise in the case of an alliance of firms with similar cultures.

Thus, the choice of strategic alliance partners, beside the potential synergy in areas of possible cooperation and collaboration, should be part of development strategy, consistent with the strategic objectives and corporate values of the company.

## **5. Conclusions and Discussions**

The article presents the author's understanding of the strategic alliance as an association of partner companies, based on the use of potential synergy in their strategic cooperation in certain areas.

The authors proposed a model of strategic alliance and developed technique to enable more balanced approach to the problem of identifying potential partners for strategic business alliance.

There are a few comments on the proposed models that can provide answers to possible questions in the discussion:

1) if the expert evaluation of potential synergy on the 7th stage is not only in points, but, for example, in monetary terms, it is necessary first to normalize the matrix 'solutions' given the monotony nature of the objective evaluation criteria functions.

2) in order to avoid compensation effects at the additive weighing in 9th stage TOPSIS method can be used for an extended matrix 'decisions' (Table 2), where each potential partner company is assessed by experts with a potential synergy value in scope of cooperation for each direction of interaction. For this matrix weighting we use weights  $w_j^{(k)}$  given the

importance of scope of cooperation  $W_k$  according the formula:

$$W_j^{(k)} = W_k w_j^{(k)}, k = 1, 2, \dots, m; j = 1, 2, \dots, N_k.$$

Note also that the use of this technique can be carried out under the simplified procedure, without detailing the scope of cooperation (in directions of cooperation), assessing potential synergies and expert way for each scope of cooperation and using the method TOPSIS.

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