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ASSESSMENT OF ECONOMIC EFFECT FROM APPLICATION OF COMBINED MODEL OF SOURCING'S MANEUVER AT INDUSTRIAL ENTERPRISE

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ABSTRACT

Since the emergence of the concept of "outsourcing" in economic science in economics, the process of forming a new direction, characterized by the development of new models, forms and types of sourcing and on the basis of their strategic development programs, has begun. Each of the currently existing sourcing models has its advantages and disadvantages and its scope. Also today in the scientific and practical literature presents a variety of methods and techniques for assessing the feasibility and effectiveness of the use of a sourcing model, one or another of its type. However, recently, hybrid sourcing models such as space sourcing, noosourcing, and sourcing's maneuver models have become popular. A key feature of hybrid models is to combine the main advantages of sourcing models while minimizing their drawbacks. Models of sourcing's maneuver, unlike co sourcing or noosourcing, have a more complex structure; moreover, large industrial enterprises can apply more complex models of sourcing's maneuver, which include several simple models. Therefore, the issue of developing a reliable methodology for the economic assessment of the use of combined sourcing's maneuver models becomes urgent. The purpose of this work is to reveal the essence of the combined model of sourcing's maneuver and to develop a methodology for assessing the economic effect of the use of this model. The essence of the combined model of the sourcing's maneuver is disclosed and a method for estimating the economic effect of the use of this model is developed. The approach used in the development of this methodology is also relevant in the construction of similar methods for assessing the economic effect of the use of other forms and types of the combined sourcing's maneuver model.

INTRODUCTION

Since the emergence of the concept of "outsourcing" in economic science in economics, the process of forming a new direction, characterized by the development of new models, forms and types of sourcing and on the basis of their strategic development programs, has begun. Each of the currently existing sourcing models has its advantages and disadvantages and its scope. For example, today, along with well-known sourcing models, such as insourcing and outsourcing, the crowdsourcing model is gaining popularity, which involves solving volunteer problems using information technology [1].

The main advantages of crowdsourcing are:

1. the ability to test new ideas, products of services on end-users, who are project participants [2];
2. the possibility of attracting third-party expertise [2];
3. the ability to aggregate information, experience, opinions, forecasts, preferences and ratings [3].

Despite the demand for crowdsourcing projects, for example, today such projects are being implemented in PJSC «Sberbank» [4], "NAMI" [5], Government of Moscow [6], this model has its drawbacks, the main of which are:

1. the lack of control and quality assurance is the problem of agency costs and the need to involve expert communities [7];
2. high overhead and associated costs of communication with each individual consumer or consumer groups [8];
3. low efficiency of collective intellectual activity [9];
4. "Matthew effect" - a social phenomenon consisting in the fact that the benefits are received by the one

who already possesses them, and the initially deprived is deprived even more [9].

Similarly, to the crowdsourcing model, outsourcing and insourcing also have their advantages and disadvantages; moreover, certain types and modifications of these models can be effectively applied in some cases and absolutely inexpedient in others. For example, single sourcing and multi sourcing, which are variations of outsourcing, have fundamentally different motives for their use. [Table 1] presents the main advantages and disadvantages of single sourcing and multi sourcing [10].

KEY WORDS

Out sourcing, insourcing, sourcing's maneuver model, marginal profit, economic valuation.

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Table 1: The main advantages and disadvantages of single sourcing and multi sourcing

	Singlesourcing	Multisourcing
Benefits	Strategic Partnership Getting the expected effects from outsourcing	Competitive environment among suppliers High production capacity
Disadvantages	Supplier monopoly position Capacity limitations	Increase in costs Lack of expected business simplification

For proper selection of the required form or type of sourcing model and its effective application, you should use the appropriate methods and techniques. To date, the scientific and practical literature presents a variety of methods and techniques to assess the feasibility [11; 12; 13; 14; 15; 16] and efficiency [17; 18; 19] application of one or another sourcing model, one or another of its kind.

However, recently, hybrid sourcing models such as space sourcing, no sourcing, and sourcing’s maneuver models have become popular. A key feature of hybrid models is to combine the main advantages of sourcing models while minimizing their drawbacks. If space sourcing and no-sourcing imply parallel use of no more than two sourcing models, in particular, sourcing implies combining enterprise resources with third-party resources [20], and sourcing implies organizing expert networking communities that are intermediate between crowdsourcing and outsourcing [21], sourcing’s maneuver models have a more complex structure. Moreover, large industrial enterprises can apply complex sourcing’s maneuver models, which include several simple models.

MATERIALS AND METHODS

Before revealing the essence of complex models of sourcing’s maneuver, consider some simple models associated with the use of outsourcing, insourcing and restructuring of production areas.

Creating a joint venture on the basis of a subsidiary

This model is presented in [Fig. 1].

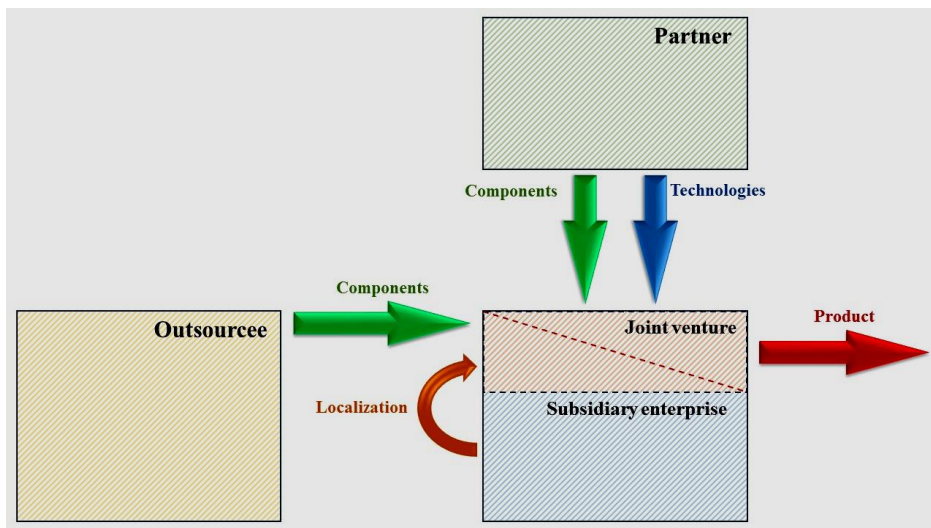


Fig. 1: Creating a joint venture on the basis of a subsidiary.

An example of the use of this sourcing’s maneuver model is the creation of a joint venture PJSC «KAMAZ» and «Marcopolo S.A.» on the basis of a subsidiary of PJSC «NEFAZ». This joint venture is engaged in the production of small-class Marcopolo buses based on the KAMAZ chassis [22].

Use of components from local outsourcers for products of an assembly plant

This model is presented in [Fig. 2].

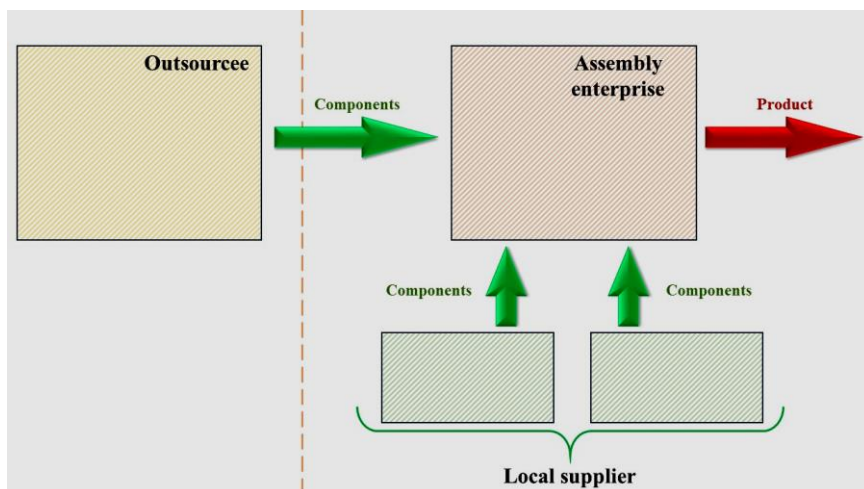


Fig. 2: The use of components from local outsourcers for products of an assembly plant.

An example of the use of this model of sourcing’s maneuver is the creation of an assembly enterprise LLC «KAMAZ-Vostok» in the Far Eastern Federal District, which was engaged in the production of special equipment based on the KAMAZ chassis using Korean superstructures and components from local manufacturers [22].

Combined sourcing’s maneuver models

As noted above, businesses can apply more complex models that include several simple sourcing’s maneuver models. These complex models will be called the combined sourcing’s maneuver models.

For example, by combining two simple models “localization of components of a subsidiary’s products” and “creating a joint venture on the basis of a subsidiary”, we get a complex, that is, unified, sourcing’s maneuver model, which can be of a sequential, or parallel, or parallel-sequential type. [Fig. 3, 4 and 5] show the possible schemes of these types of the resulting combined model.

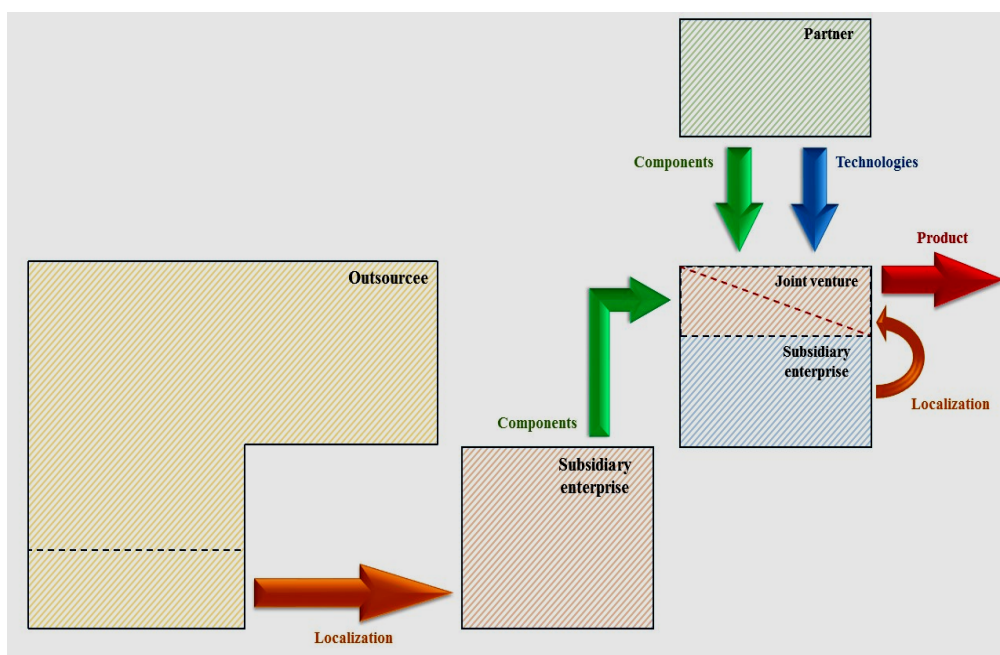


Fig. 3: Combined sequential-type sourcing's maneuver.

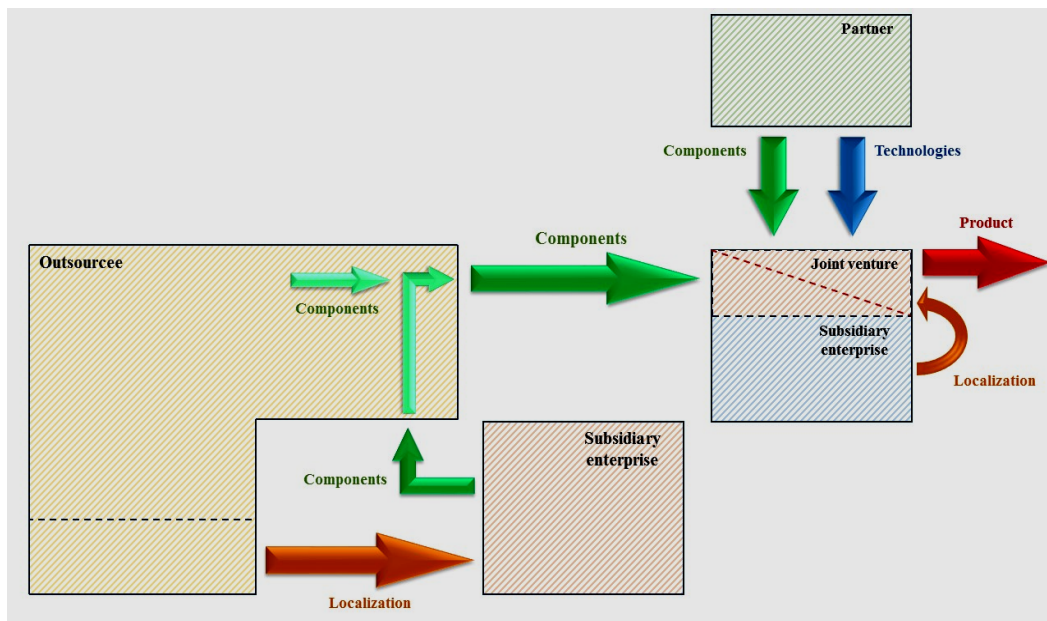


Fig. 4: The combined model of parallel sourcing's maneuver.

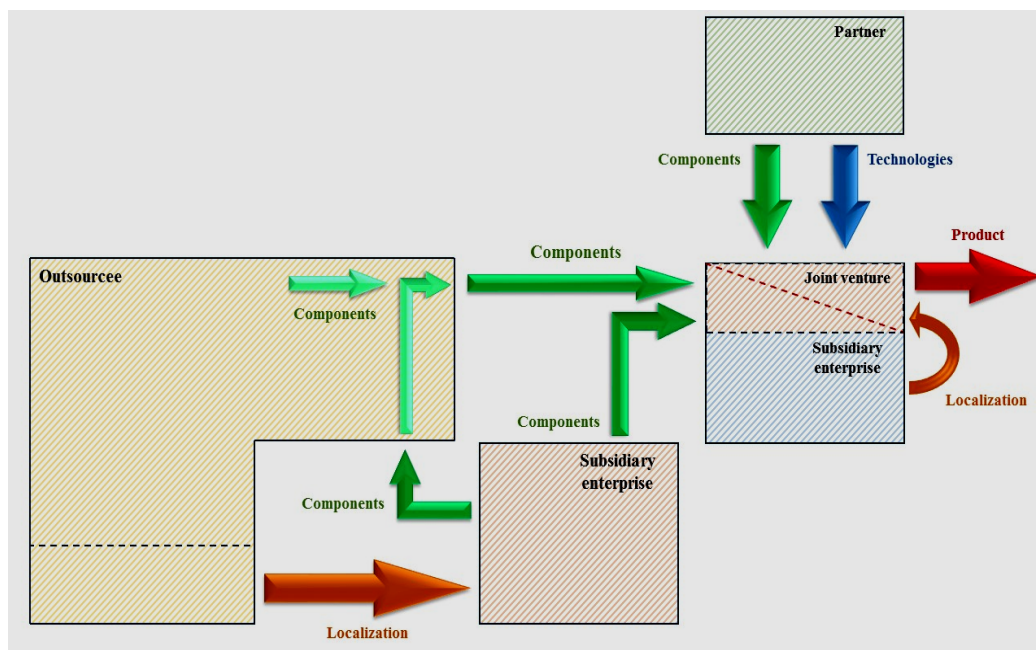


Fig. 5: The combined model of parallel-sequential sourcing's maneuver.

RESULTS AND DISCUSSION

To build a methodology for assessing the economic effect of applying the above presented combined sourcing's maneuver models, we introduce the concepts of "full margin profit of a product before applying a combined sourcing's maneuver model" and "full margin profit of a product after applying a combined sourcing's maneuver model". Full marginal profit before applying the combined sourcing's maneuver model.

This indicator depends on how the product was manufactured before its modernization in the framework of the sourcing's maneuver model. There are two options here:

1. A subsidiary, on the basis of which a joint venture will be created as part of the restructuring, produces a product without the use of components and components from the parent company;
2. A subsidiary company manufactures a product using components and components from the parent company.

If the first option is implemented, the indicator "full marginal profit of a product before applying the combined sourcing's maneuver model" is equal to the marginal profit of a subsidiary per unit of output:

$$S_{FMI} = S_{MI} \quad (1)$$

S_{FMI} - full marginal profit of the product before applying the combined sourcing's maneuver model; S_{MI} - marginal profit of a subsidiary per unit of output before applying the combined sourcing's maneuver model.

If the second option is implemented, the indicator "full marginal profit of the product before applying the combined sourcing's maneuver model" is calculated using the following formula

$$S_{FMI} = S_{MI} + S_{CI} \quad (2)$$

S_{FMI} - full marginal profit of the product before applying the combined sourcing's maneuver model; S_{MI} - marginal profit of a subsidiary per unit of output before applying the combined sourcing's maneuver model; S_{CI} - outsourcee's marginal profit from the production of components and components per unit of product of a subsidiary to the application of the combined model sourcing's maneuver.

Full marginal profit after applying the combined sourcing's maneuver model

This indicator depends on what type of model has been applied. If the enterprise has applied a model of the sequential type, then the indicator is calculated using the following formula:

$$S_{FM} = a * S_M + L_S + S_S + L_O \quad (3)$$

S_{FM} - full marginal profit of the product after applying the combined sourcing's maneuver model; a - the share of outsourcee in the share capital of the joint venture; S_M - marginal profit of a joint venture per unit of output; L_S - marginal profit of a subsidiary from the localization of components of the joint venture's products per unit of output; S_S - marginal profit of the established subsidiary from the production of components of the joint venture's products per unit of output; L_O - outsourcee's marginal profit from the localization of components for the products created subsidiary per unit of output.

If the parallel type of the combined sourcing's maneuver model was applied, the indicator is calculated using the following formula:

$$S_{FM} = a * S_M + L_S + S_{SO} + L_O + S_O \quad (4)$$

S_{FM} - full marginal profit of the product after applying the combined sourcing's maneuver model; a - the share of outsourcee in the share capital of the joint venture; S_M - marginal profit of a joint venture per unit of output; L_S - marginal profit of a subsidiary from the localization of components of the joint venture's products per unit of output; S_{SO} - marginal profit of the established subsidiary from the production of components of the joint venture's products for the transfer of their outsourcee per unit of output; L_O - outsourcee's marginal profit from the localization of components for the products created subsidiary per unit of output; S_O - outsourcee's margin profit from the production of components of joint venture products per unit of output.

If a parallel-sequential type has been applied, the indicator is calculated using the following formula:

$$S_{FM} = a * S_M + L_S + S_O + S_{SO} + L_O + S_O \quad (5)$$

S_{FM} - full marginal profit of the product after applying the combined sourcing's maneuver model;
 a - outsourcee's share in the share capital of the joint venture; S_M - marginal profit of a joint venture per unit of output; L_S - marginal profit of a subsidiary from the localization of components of the joint venture's products per unit of output; S_s - marginal profit of the established subsidiary from the production of components of the joint venture's products per unit of output; S_{SO} - marginal profit of the established subsidiary from the production of components of the joint venture's products for the transfer of their for outsourcee per unit of output; L_o - outsourcee's marginal profit from the localization of components for the products created subsidiary per unit of output; S_o - outsourcee's margin profit from the production of components of joint venture products per unit of output.

The economic effect is estimated by the difference between the indicators "full marginal profit of a product after applying the combined sourcing's maneuver model" and "full marginal profit of the product before applying the combined sourcing's maneuver model":

$$E = S_{FM} - S_{FMI} \tag{6}$$

E - economic effect from the use of a combined sourcing's maneuver model.

If from formula (6) it follows that $E \geq 0$, then the application of the combined sourcing's maneuver model is expedient and effective. If $E < 0$, then the negative economic effect from the use of the combined sourcing's maneuver model is obvious.

If an enterprise produces more than one type of product, then for economic evaluation it is necessary to enter the indicator "cumulative economic effect from the use of the combined sourcing's maneuver model", which is calculated using the following formula:

$$EC = \sum_{i=1}^n E_i \tag{7}$$

EC - the cumulative economic effect of using the combined sourcing's maneuver model;
 n - the number of product types produced by the enterprise (outsourcer).

If the indicator "the cumulative economic effect from the use of the combined sourcing's maneuver model" is greater than or equal to zero, that is $EC \geq 0$, the use of the combined sourcing's maneuver model is expedient and effective, and if the indicator is less than zero ($EC < 0$), then the negative economic effect from the use of the combined sourcing model maneuver. The maximum feasibility and effectiveness of the combined sourcing's maneuver model is achieved when each is strictly greater than zero (formula 8).

$$\begin{cases} E_i > 0, \\ i = \overline{1, n} \end{cases} \tag{8}$$

CONCLUSIONS

When assessing the economic effect of using the combined sourcing's maneuver model, in addition to fulfilling condition (8), it is also necessary to take into account how much the marginal profit of the product increased during the restructuring of the enterprise. Therefore, it is necessary to determine the target value by which the company plans to increase the marginal profit of the product through the use of a combined sourcing's maneuver model. This value is determined individually for each enterprise based on a variety of factors, such as, for example, in which industry sector the enterprise operates, what products it produces, and so on. Therefore, to determine the maximum feasibility and effectiveness of the use of the combined sourcing's maneuver model, it is necessary to refine expression (8) as follows:

$$\begin{cases} E_i \geq b_i, \\ i = \overline{1, n} \end{cases} \tag{9}$$

b - the amount by which outsourcee plans to increase the marginal profit of the product through the use of a combined sourcing's maneuver model.

CONFLICT OF INTEREST

There is no conflict of interest.

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None.

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