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SELECTION OF SUPPLIERS UNDER CONDITIONS OF UNCERTAINTY AS A COMPONENT OF PROCUREMENT MARKETING

ABSTRACT

The choice of suppliers of material and technical resources is one of the most important decisions in procurement marketing. Effective decisions on the selection of suppliers are the basis for creating a database of sources of supply. The aim of the study is to analyse approaches to the selection of suppliers of material and technical resources in procurement marketing and substantiate the directions of increasing its efficiency under conditions of uncertainty.

In order to make a balanced selection of suppliers, the authors propose an algorithm for organising procurement activities and criteria for evaluating potential suppliers, substantiating the use of a multi-criteria approach that allows a balanced approach to the selection of a supplier. The main criteria and scale for evaluating suppliers of material resources for the SE "Arena Lviv" are determined, and the results of their expert evaluation are presented.

The algorithm for organising procurement activities and the multi-criteria approach to selecting suppliers, developed by the authors, can be recommended for enterprises and organisations engaged in procurement activities.

Keywords: procurement marketing, supply of material and technical resources, methods of supplier selection, supplier selection criteria, pairwise comparison method, direct evaluation method, integral supplier selection criterion, supply chains

JEL Classification: M31, L83

INTRODUCTION

The goal of procurement marketing is to fully satisfy the company's needs for material and technical resources with the highest possible economic efficiency. Supply is an important part of the overall business strategy, and effective supply activities provide an opportunity to gain a competitive advantage over major competitors operating in the same industry. Therefore, in today's environment, the problem of selecting suppliers and establishing partnerships with them is a pressing one.

Selecting suppliers of material and technical resources is one of the most important decisions in procurement marketing. When choosing suppliers, companies try to ensure their functioning while optimising the costs associated with procurement processes and maintaining the required level of quality of the goods and services offered. Effective supplier selection decisions are the basis for building a supply base. The placement of an order for the supply of material and technical resources depends on a number of criteria, including compliance with quality indicators, volume, delivery terms, price and service. When selecting suppliers, we also consider their financial position, reputation, degree of cooperation, location, etc.

The decision to select suppliers of material and technical resources can be viewed as a decision that is made in the context of risk. Therefore, in order to effectively apply the supplier selection algorithm, an enterprise must identify possible supply options, criteria for evaluating suppliers and possible risks of cooperation.

The process of supplier selection is a multi-criteria problem that concerns both quantitative and qualitative indicators. Determining the relationship between the criteria requires the use of appropriate analytical methods that would support the company's decision-making. The development of the economy leads to an increase in dependence on suppliers, and the direct and indirect consequences of wrong decisions increasingly affect the company's activities.

LITERATURE REVIEW

The peculiarities of procurement marketing, its tasks and its tools were considered in their scientific works by domestic and foreign scientists. Kiktenko Z.P. and Kupa I.V. in [10] focused on the specifics of procurement marketing, in particular, its focus on suppliers, the formation of long-term relationships with them, finding solutions together with the material and technical, production and sales departments of the enterprise and the supplier, coordinating the work of the material and technical departments, finding and developing new sources of supply. Kushnir T.M. in [12] substantiated the feasibility of using purchasing marketing and analysed the main methodological problems of its use by domestic enterprises. Popko O., Slipetskyi O. and Kuzo N. considered the main tasks and main functions of procurement marketing, which are aimed at meeting the needs of the enterprise's end users [19].

Delke V., Schiele H. and Buchholz W. in [4] consider special procurement strategies, processes, tools and necessary skills, taking into account the impact of digitalisation in procurement. Foerstl K., Kähkönen A.-K., Blome C. and Goellner M. in [6] consider the concept of market orientation of supply for procurement and supply chain management, differences in its application within one company and other companies, the ability to use market information to assess, integrate and re-configure heterogeneously dispersed resources in procurement and supply chain management in a way that best reflects the characteristics of the company's supply environment. Andersen P.H., Laursen L.N. and Moller M.M. in [1] investigated the contribution of supply management to the value creation of business ecosystems, taking into account that digital technologies and networking reduce the cost of establishing contacts and cooperation with external parties.

Yang Z., Zheng Y., Li J., Zhu S. X., & Yang C. proposed to use the Stackelberg game-theoretic model to analyse the decisions on the number of purchases and delivery time, taking the manufacturer as the leader and the supplier as the follower and obtained the equilibrium strategies of the two players. They also provided rules for decision-making in these conditions [25].

Staritskyi T. M. in [23] analysed the types of procurement situations in the B2B market and substantiated the effectiveness of using models of industrial buyers' behaviour, which take into account different approaches to motivating buyers of material and technical resources. The author develops recommendations for the use of models that best describe the specifics of buyer behaviour when developing standards for their service.

One of the most important tasks of procurement marketing is the selection of suppliers, which has been studied by many scholars. In particular, A.O. Lopatin substantiates the importance of selecting suppliers in the supply chain and describes possible criteria for this. The author proposes to form a rating of suppliers' activities and to forecast the final rating indicator, which can facilitate the selection of suppliers of material and technical resources. In [16], the main advantages and disadvantages of supplier selection methods are also considered and the need to compare the actual results of deliveries with the predicted indicators is substantiated.

The study [21] analyses the methods and models of supplier selection. The characteristics of the models are determined in accordance with the number of suppliers, criteria, positions of material and technical resources, periods, goals and decision-makers. The author also substantiates the use of relevant criteria for decision-making.

Novikova N.M. in [17] proposed to use the methods of expert assessments, ranking (rating), cost estimation (mission method), analytical, dominant characteristics, categories of advantages, and ABC analysis to evaluate suppliers. The author identifies the main quantitative and qualitative criteria for evaluating suppliers, in particular, the price of the proposed material and technical resources, their quality, financial conditions, delivery time, quality of service, delivery costs, possibility of unscheduled deliveries, location of the supplier, procedure for satisfying advertisements, reputation of the enterprise, environmental safety, and proposes a structural and logical sequence for selecting potential suppliers for an enterprise.

Olkhovska T.O. considers the task of selecting suppliers of material and technical resources and proposes a method of hierarchy analysis for selecting suppliers, where the best option is selected sequentially from top to bottom according to the accepted levels of importance [18]. The authors in [15] analyse the criteria and methods on the basis of which it is advisable to carry out a rating assessment of suppliers and formulate the authors' approach to determining the criteria by

which it is recommended to select suppliers. In order to form effective cooperation with selected suppliers, it is recommended to move to establishing partnerships and strategic alliances by concluding long-term agreements on future quality levels, delivery terms and price levels. The issues of assessing the reliability of suppliers are discussed in the study by Hirna O. B. [7].

Rusinova O. S., Voznyuk M. A., Parubets O. M., Shkolenko O. B. and Yermishova S. V. propose a methodical approach to the assessment of enterprises-suppliers of material support, which allows to determine the best supplier among the proposed ones, to identify the strengths and weaknesses of interaction with the selected supplier company. To verify the results of the assessment, the authors used a hierarchical model for selecting the optimal supplier, which was tested on pre-identified potential suppliers in terms of lead time, degree of responsiveness to changes, performance in accordance with requirements, and the level of development of the quality management system in accordance with the requirements of ISO 9000 [22].

Ivanova M. I., Dudnyk A. V., Yashkina N. V. and Zaiets N. M. proposed to use a composite model for selecting a supplier, which involves a scoring assessment of the levels of the weighted average price of raw wine and materials, their quality; supply organisation (taking into account the conditions of the organisation); supplier loyalty and financial stability, as well as a comprehensive integrated assessment. The proposed methodology uses data that is open and publicly available [8].

Velychko O., Velychko L., Butko M., and Khalatur S. in [24] consider the principles of integrated modelling of decisions in the operating systems "procurement marketing - supply logistics" and develop a methodology for selecting strategic alternatives based on integrated modelling of individual marketing logistics chains and gradual formation of the composition of supply chain participants. The authors use the hierarchy analysis method and the double sourcing planning method to justify the choice of a supply strategy in the market of material resources; the methods of optimal planning in accordance with the Bayesian criterion, linear planning and logistic modelling to justify the choice of management decisions.

Endo A. and Yamakawa E. substantiate the introduction of sustainable procurement to avoid the risks associated with the sustainable development of supply chains in the Japanese manufacturing sector. The results obtained by the authors can serve as a guide for companies in the formation of a procurement strategy [5].

In today's environment, assessing the efficiency and effectiveness of the procurement process is becoming increasingly important, providing information for making informed decisions. To determine the importance of procurement efficiency, E. Kusriani, P. S. Carolina, E. Worldailmi, and M. Arifin have developed an appropriate system of key performance indicators. The study identified 41 key performance indicators, including 8 for procurement planning, 25 for procurement implementation and 8 for performance monitoring, which provide a comprehensive toolkit for assessing and improving the efficiency of the procurement process [14].

Bode C., Burkhart D., Schültken R., and Vollmer M. analyse the role of procurement over the past decades, which has changed from clerical support to a strategic role that contributes to company growth, innovation and value creation. Based on the results of a survey of procurement managers, the authors have developed a concept that gives an idea of the future of procurement [3].

However, the reviewed scientific sources lack a structured approach to selecting suppliers and adapting selection criteria to uncertainty.

AIMS AND OBJECTIVES

The purpose of this study is to analyse approaches to the selection of suppliers of material and technical resources in procurement marketing and to substantiate the directions of improving its efficiency. To achieve this goal, the following tasks need to be performed:

- to propose an improved algorithm for the procurement activities of an enterprise;
- to analyse the existing methods of selection of suppliers of material and technical resources;
- to determine the main criteria for selecting suppliers of material resources;
- to substantiate the scale of evaluation of suppliers;
- to test the proposed method for determining suppliers of lawn grass seeds for the football stadium "Arena Lviv".

METHODS

The results of the study were obtained by using the methods of system-structural analysis - to form an algorithm for procurement activities; grouping - to classify criteria for selecting potential suppliers; the method of pairwise comparisons - to determine the importance of individual criteria; the method of direct evaluation - to determine the scale for evaluating suppliers of material resources; integral evaluation - to compare suppliers and select the supplier that best meets the requirements of the enterprise.

RESULTS

The effectiveness of procurement marketing directly depends on the choice of procurement sources and competitive suppliers of material and technical resources. In today's environment, enterprises and suppliers are becoming business partners on B2B and B2C platforms, which will help optimise costs and improve the quality of goods and services [15].

Suppliers, as an element of the marketing microenvironment of an enterprise, have a significant impact on its activities. Regardless of what types of goods are supplied to the enterprise by suppliers, the basis of interaction with them is contractual relations built in accordance with the current legislation. The implementation of contractual relations on a legal basis, which are fixed by the contract, allows to ensure the receipt of products and protect the economic interests of both parties [9].

In general, there are two areas of supplier selection:

1. Selection of suppliers from enterprises with which business relations have already been established. The advantages are the availability of information about suppliers and predictability of cooperation terms, while the disadvantages are possible sub-optimal cooperation conditions.
2. Selection of new suppliers based on the results of search and analysis of new information. The advantages are the ability to choose the best types of material and technical resources and terms of supply, and the disadvantages are the additional costs of checking potential suppliers [20].

The search for new suppliers can be carried out in the following areas [17]:

1. Announcement of a tender, which is held if the amount of procurement exceeds UAH 100 thousand for state-owned enterprises, and plans to establish long-term business relations with the supplier for private enterprises. Tender organization is a rather complicated procedure that involves the development of tender documents, and evaluation of proposals with justification of the reasons for rejection or acceptance of proposals. The company selects those suppliers who have submitted the most favourable tender offer.
2. Studying advertising materials, advertisements in the media, on the Internet, catalogues, etc.
3. Visiting industry exhibitions and fairs.
4. Correspondence with the sales staff of potential suppliers.

In the current environment, domestic enterprises operate under conditions of uncertainty, which may be caused by the lack of necessary information, the complexity of processing the available information, and the inability to predict the consequences of decisions made over time as a result of Russia's aggression. Therefore, in order to reduce the impact of uncertainty factors, in particular in the area of supply, enterprises should consider several sources of supply of key material and technical resources.

The algorithm of procurement activities of the enterprise is shown in Figure 1.

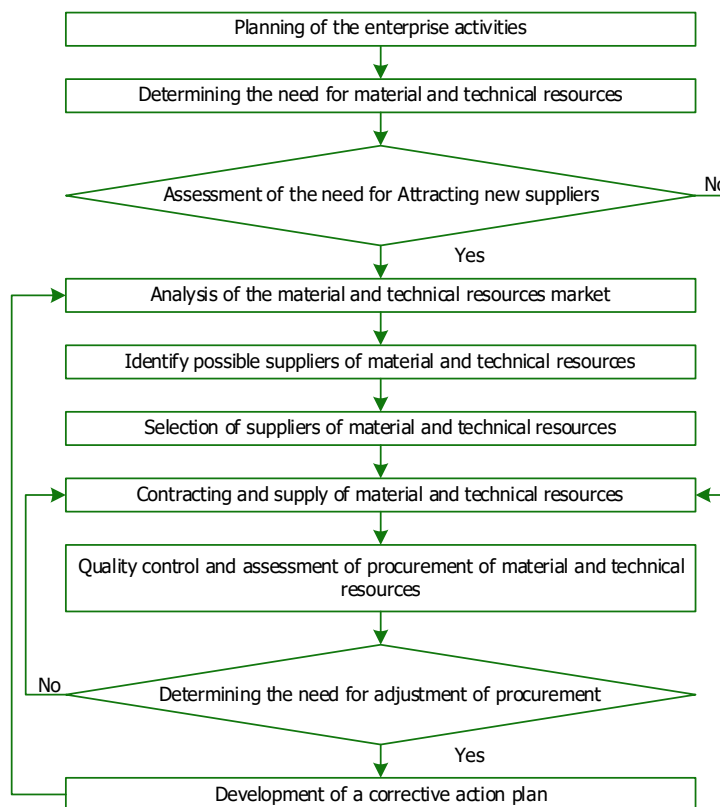


Figure 1. Algorithm of procurement activities of an enterprise. (Source: compiled by the authors on the basis of [8, 9, 22, 23])

Supplier selection is one of the most important tasks of procurement marketing. The success of an enterprise in providing its customers with quality goods and services depends on how well suppliers fulfil their obligations. Therefore, the effective solution of the supplier selection task is the basis for the successful operation and creation of a sustainable supply base for each enterprise [16].

Various methods can be used to select suppliers of material and technical resources, the features of which are presented in Table 1.

Table 1. Key methods for selecting suppliers of material and technical resources. (Source: compiled by the authors on the basis of [2, 15])

| Methods | Essence of the Method | Main tools |
|---|---|---|
| A multi-criteria approach to evaluating potential suppliers | Identification of essential criteria, assessment of their significance, determination of the scale and scoring of criteria, calculation of the integral indicator | Expert evaluation, including the method of pairwise comparisons and direct evaluation |
| Step-by-step rating assessment of potential supplier | Formation of a rating of potential suppliers by quality characteristics of goods, formation of a rating of suppliers by price, formation of a rating of suppliers by the level of services | Expert evaluation, including the ranking method |
| Cost estimates (the "mission" method) | The supply is divided into several possible variants (missions), and for each one, all costs and revenues for each supplier are calculated (taking into account logistics risks). The best option is selected from the options considered according to the total profit criterion. The method allows us to determine the "cost" (expenses) of choosing a supplier | Analytical methods for determining costs and profits, exhaustive search method |
| Dominant characteristics | Focusing on one selected parameter (criterion). This can be the lowest price, the highest quality, the convenience of the schedule, etc. | Ranking on the basis of a single parameter |
| Categories of benefits | The supplier's assessment is based on information from many structural units of the enterprise | Analysis of qualitative and quantitative information, ranking |

When using the multi-criteria approach of potential suppliers, it is advisable to use the algorithm given in [11]:

1. Developing a system of possible essential criteria for evaluating suppliers.
2. Formation of a conflict-free system of criteria.

3. Assessment of the importance of individual criteria.
4. Evaluation of each supplier according to the selected criteria.
5. Calculation of the integral criterion and selection of suppliers.

The first stage of the proposed algorithm is to define a system of essential criteria for evaluating suppliers, which can be grouped according to various criteria (Table 2).

| Attributes | Possible Criteria |
|---|--|
| Economic condition and business reputation of potential suppliers | <ul style="list-style-type: none"> ▪ the financial position of the company; ▪ experience in the market; ▪ existence of ties with the aggressor country; ▪ the business reputation of partners of potential suppliers; |
| Characteristics of material and technical resources | <ul style="list-style-type: none"> ▪ compliance of material and technical resources with the customer's requirements; ▪ the level of supplier prices compared to market prices; ▪ the possibility of obtaining price discounts; ▪ payment terms, including the possibility of deferred payment for material and technical resources; ▪ availability of certificates of conformity; |
| Terms of cooperation | <ul style="list-style-type: none"> ▪ the supplier's interest in developing partnerships; ▪ order fulfilment time and its comparison with the industry average; ▪ efficiency of the supplier's sales department; ▪ quality of the delivery procedure; ▪ the supplier's ability to provide additional services; ▪ supplier's compliance with agreed delivery schedules; ▪ quality of preparation of supporting documents; ▪ the supplier's initiative to reduce costs; ▪ the supplier's ability to eliminate the causes of complaints; ▪ readiness of the supplier to implement innovations; ▪ the supplier's ability to assist in solving technical problems; ▪ supplier's response to problems related to the quality of delivery; ▪ the possibility of forming a joint information system. |

To further use the selected criteria to form a conflict-free system of independent criteria, they are tested for logical freedom from contradictions and relative independence. Comparison of each criterion with the others allows one to identify both dependent criteria, when one of the criteria covers the other in terms of content, and conflicting criteria when one criterion contradicts the other. Conflicting criteria should be excluded from consideration.

To assess the importance of individual criteria, it is advisable to use a survey of experts using the method of pairwise comparisons, the essence of which is to compare the criteria in pairs by experts in order to determine the most important in each pair.

The results of the expert survey are obtained in the form of a preference matrix with elements x_{ij} , equal to the number of cases when criterion i prevails over criterion j . Each expert who fills in this matrix should give a score x_{ij} depending on which factor is more important, this score can be 1 or 0. In the topmost column of the table, write down the frequency of preference v_i the i -th criterion in the i -th row, n in the bottom row of the table, write down the frequency μ_k of preference for the k -th criterion in the k -th column for the remaining criteria. Then the value is calculated for each i -th criterion:

$$m_i = \mu_i + v_i, \quad (1)$$

that is the frequency of preferences of the i -th criterion determined by a certain expert. The importance of each criterion is calculated according to the formula:

$$w_i = \frac{m_i}{\sum m_i}. \quad (2)$$

The obtained number of advantages for each criterion should be normalised taking into account the results of all involved experts, which will determine the importance for each criterion.

To evaluate potential suppliers according to the selected criteria, it is advisable to use the method of direct evaluation, having previously selected a scale for evaluation. In this case, the task of the experts is to assign each of the criteria to a certain interval of scores in accordance with the properties. Each expert can give the same score to two or more qualitatively different factors. Next, it is necessary to obtain the average score for each criterion, taking into account the number of experts.

The integral criterion is calculated by the formula [11]:

$$K_3 = \sum_{i=1}^n K_i \alpha_i, \tag{3}$$

where K_i - the assessment of the i -th criterion for the supplier; α_i - the importance of the i -th criterion.

Based on the calculations, a range of suppliers' suitability is formed, on the basis of which a reasonable choice is made.

For example, we use the proposed method to determine suppliers for the supply of lawn grass seeds for the "Arena Lviv" football stadium. For this purpose, a list of the main criteria was formed and an evaluation scale was determined (Table 3).

| Table 3. Main criteria and scale of evaluation of suppliers of material resources for SE Arena Lviv. | | | |
|--|--|---|--|
| Criteria | Grading Scale | | |
| | 1-4 points | 5-8 points | 9-10 points |
| Financial position of the company | Unstable, with losses observed | Stable and profitable | Stable, with profits growing steadily |
| Experience in the market | Little work experience (1-3 years) | Some work experience (4-7 years) | Extensive work experience (over 7 years) |
| The existence of ties with the aggressor country | Economic relationships exist | Economic relationships are in the process of termination (sale of assets) | No economic relationships |
| The business reputation of partners of potential suppliers | A significant number of supplier's partners have a poor reputation | A small number of supplier's partners have a poor reputation | All supplier's partners have a good reputation |
| Compliance of material and technical resources with the customer's requirements | Resource characteristics have some deviations | Major resource characteristics meet requirements | Resource characteristics fully meet the requirements |
| Level of supplier prices compared to market prices | Supplier prices are above market prices | Supplier prices are in line with market prices | Supplier prices are below market prices |
| Possibility of obtaining price discounts | Discounts are not granted or are granted in a small amount | Discounts are granted in case of long negotiations | Under certain conditions, one can count on significant discounts |
| Possibility of deferred payment for material and technical resources | No grace period or grace period of up to one month | Grace period of one to three months | Grace period of more than 3 months |
| Availability of certificates of conformity | Absent or not fully compliant | Mainly compliant | Fully compliant |
| Supplier's interest in developing partnerships | None | Limited | Significant |
| Order fulfilment time and its comparison with the industry average | Above the industry average | In line with the industry average | Below the industry average |
| Quality of the delivery procedure | Low (possible damage, incomplete documentation) | Medium (minor damage, inaccuracies in documentation) | High |
| Supplier's ability to provide additional services | Additional services are not provided or are provided as an exception | The supplier offers several additional services | The supplier offers additional services and may expand their list |
| Supplier's compliance with agreed delivery schedules | Delivery schedules are not met | Delivery schedules are mostly met | Delivery schedules are always met |
| Quality of preparation of supporting documents | Low (errors are possible) | Medium (inaccuracies occur) | High |
| Supplier's initiative to reduce costs | Lack of initiatives and/or response to such initiatives | Proposals to reduce costs | Proposals and responses to the company's initiatives to reduce costs |
| Supplier's ability to eliminate the causes of complaints | No response or sluggish response | There is a response to complaints | Rapid response to complaints |
| Readiness of the supplier to implement innovations | Innovations are not implemented | Innovations are of interest | Supplier considers innovation proposals and implements them |
| Supplier's ability to assist in solving technical problems | No assistance or little interest | Offers limited assistance | Provides assistance at the appropriate level |
| Supplier's response to problems related to the quality of delivery | No or little response | Responds to problems, offers solutions | Corrective actions are taken, and compensation is offered |
| Possibility of forming a joint information system | No or little interest | Interest in the proposals | Discussion and steps towards creating a common information system |

Using the proposed scale, employees of SE "Arena Lviv" evaluated suppliers for the supply of lawn grass seeds for the football stadium (Table 4).

Table 4. Evaluation of suppliers of material resources for SE Arena Lviv.

| Criteria | Symbol | ENGO LLC | Agrostis LLC | Agrolux-Ukraine LLC |
|---|--------|----------|--------------|---------------------|
| Financial position of the company | K1 | 8 | 8 | 8 |
| Experience in the market | K2 | 9 | 9 | 9 |
| The existence of ties with the aggressor country | K3 | 2 | 9 | 9 |
| The business reputation of partners of potential suppliers | K4 | 9 | 9 | 9 |
| Compliance of material and technical resources with the customer's requirements | K5 | 9 | 9 | 8 |
| Level of supplier prices compared to market prices | K6 | 9 | 8 | 8 |
| Possibility of obtaining price discounts | K7 | 8 | 8 | 8 |
| Availability of certificates of conformity | K8 | 10 | 10 | 10 |
| Supplier's interest in developing partnerships | K9 | 10 | 9 | 8 |
| Order fulfilment time and its comparison with the industry average | K10 | 8 | 8 | 7 |
| Quality of the delivery procedure | K11 | 9 | 9 | 9 |
| Supplier's ability to provide additional services | K12 | 10 | 8 | 8 |
| Supplier's compliance with agreed delivery schedules | K13 | 10 | 10 | 9 |
| Quality of preparation of supporting documents | K14 | 7 | 7 | 8 |
| Supplier's initiative to reduce costs | K15 | 7 | 6 | 6 |
| Supplier's ability to eliminate the causes of complaints | K16 | 8 | 5 | 5 |
| Readiness of the supplier to implement innovations | K17 | 7 | 8 | 6 |
| Supplier's ability to assist in solving technical problems | K18 | 9 | 8 | 6 |
| Supplier's response to problems related to the quality of delivery | K19 | 8 | 8 | 6 |
| Possibility of forming a joint information system | K20 | 5 | 5 | 2 |
| Possibility to receive deferred payment for material and technical resources | K21 | 10 | 8 | 6 |

To determine the importance of each criterion, a matrix of pairwise comparisons was formed and a pairwise comparison of the criteria was carried out by the employees of SE "Arena Lviv" (Table 5).

Table 5. Matrix of pairwise comparisons of criteria.

| | K1 | K2 | K3 | K4 | K5 | K6 | K7 | K8 | K9 | K10 | K11 | K12 | K13 | K14 | K15 | K16 | K17 | K18 | K19 | K20 | K21 | v_i |
|---------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| K1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 |
| K2 | | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 |
| K3 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 18 |
| K4 | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| K5 | | | | | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 11 |
| K6 | | | | | | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 11 |
| K7 | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 12 |
| K8 | | | | | | | | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 9 |
| K9 | | | | | | | | | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 7 |
| K10 | | | | | | | | | | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 4 |
| K11 | | | | | | | | | | | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 3 |
| K12 | | | | | | | | | | | | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 5 | 5 |
| K13 | | | | | | | | | | | | | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 4 |
| K14 | | | | | | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| K15 | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 5 |
| K16 | | | | | | | | | | | | | | | | 1 | 0 | 1 | 1 | 0 | 3 | 3 |
| K17 | | | | | | | | | | | | | | | | | 1 | 0 | 0 | 1 | 0 | 1 |
| K18 | | | | | | | | | | | | | | | | | | 1 | 1 | 0 | 2 | 2 |
| K19 | | | | | | | | | | | | | | | | | | | 1 | 0 | 1 | 1 |
| K20 | | | | | | | | | | | | | | | | | | | | 1 | 0 | 0 |
| K21 | | | | | | | | | | | | | | | | | | | | | 1 | 0 |
| μ_k | 0 | 1 | 2 | 0 | 3 | 4 | 5 | 3 | 4 | 3 | 3 | 6 | 5 | 0 | 12 | 10 | 5 | 14 | 6 | 0 | 19 | - |

Based on the data in Table 3, we will determine the importance of each criterion (Table 6).

Table 6. Determine the importance of criteria for evaluating suppliers of material resources.

| Criteria | v_i | μ_k | Advantages | Importance |
|---|------------|------------|------------|--------------|
| Financial position of the company | 3 | 0 | 3 | 0.014 |
| Experience in the market | 3 | 1 | 4 | 0.019 |
| The existence of ties with the aggressor country | 18 | 2 | 20 | 0.095 |
| The business reputation of partners of potential suppliers | 2 | 0 | 2 | 0.010 |
| Compliance of material and technical resources with the customer's requirements | 11 | 3 | 14 | 0.067 |
| Level of supplier prices compared to market prices | 11 | 4 | 15 | 0.071 |
| Possibility of obtaining price discounts | 12 | 5 | 17 | 0.081 |
| Availability of certificates of conformity | 9 | 3 | 12 | 0.057 |
| Supplier's interest in developing partnerships | 7 | 4 | 11 | 0.052 |
| Order fulfillment time and its comparison with the industry average | 4 | 3 | 7 | 0.033 |
| Quality of the delivery procedure | 3 | 3 | 6 | 0.029 |
| Supplier's ability to provide additional services | 5 | 6 | 11 | 0.052 |
| Supplier's compliance with agreed delivery schedules | 4 | 5 | 9 | 0.043 |
| Quality of preparation of supporting documents | 1 | 0 | 1 | 0.005 |
| Supplier's initiative to reduce costs | 5 | 12 | 17 | 0.081 |
| Supplier's ability to eliminate the causes of complaints | 3 | 10 | 13 | 0.062 |
| Readiness of the supplier to implement innovations | 1 | 5 | 6 | 0.029 |
| Supplier's ability to assist in solving technical problems | 2 | 14 | 16 | 0.076 |
| Supplier's response to problems related to the quality of delivery | 1 | 6 | 7 | 0.033 |
| Possibility of forming a joint information system | 0 | 0 | 0 | 0.000 |
| Possibility to receive deferred payment for material and technical resources | 0 | 19 | 19 | 0.090 |
| Total | 105 | 105 | 210 | 1.000 |

The results of calculating the integral criterion for selecting suppliers of material resources for SE "Arena Lviv" are presented in Table 7.

Table 7. Evaluation of suppliers of material resources for SE Arena Lviv.

| Criteria | Importance | ENGO LLC | | Agrostis LLC | | Agrolux-Ukraine LLC | |
|--------------|------------|------------|---------------------|--------------|---------------------|---------------------|---------------------|
| | | scoring | weighted assessment | scoring | weighted assessment | scoring | weighted assessment |
| K1 | 0.014 | 8 | 0.112 | 8 | 0.112 | 8 | 0.112 |
| K2 | 0.019 | 9 | 0.171 | 9 | 0.171 | 9 | 0.171 |
| K3 | 0.095 | 2 | 0.19 | 9 | 0.855 | 9 | 0.855 |
| K4 | 0.01 | 9 | 0.09 | 9 | 0.09 | 9 | 0.09 |
| K5 | 0.067 | 9 | 0.603 | 9 | 0.603 | 8 | 0.536 |
| K6 | 0.071 | 9 | 0.639 | 8 | 0.568 | 8 | 0.568 |
| K7 | 0.081 | 8 | 0.648 | 8 | 0.648 | 8 | 0.648 |
| K8 | 0.057 | 10 | 0.57 | 10 | 0.57 | 10 | 0.57 |
| K9 | 0.052 | 10 | 0.52 | 9 | 0.468 | 8 | 0.416 |
| K10 | 0.033 | 8 | 0.264 | 8 | 0.264 | 7 | 0.231 |
| K11 | 0.029 | 9 | 0.261 | 9 | 0.261 | 9 | 0.261 |
| K12 | 0.052 | 10 | 0.52 | 8 | 0.416 | 8 | 0.416 |
| K13 | 0.043 | 10 | 0.43 | 10 | 0.43 | 9 | 0.387 |
| K14 | 0.005 | 7 | 0.035 | 7 | 0.035 | 8 | 0.04 |
| K15 | 0.081 | 7 | 0.567 | 6 | 0.486 | 6 | 0.486 |
| K16 | 0.062 | 8 | 0.496 | 5 | 0.31 | 5 | 0.31 |
| K17 | 0.029 | 7 | 0.203 | 8 | 0.232 | 6 | 0.174 |
| K18 | 0.076 | 9 | 0.684 | 8 | 0.608 | 6 | 0.456 |
| K19 | 0.033 | 8 | 0.264 | 8 | 0.264 | 6 | 0.198 |
| K20 | 0 | 5 | 0 | 5 | 0 | 2 | 0 |
| K21 | 0.09 | 10 | 0.9 | 8 | 0.72 | 6 | 0.54 |
| Total | 1 | 172 | 8.167 | 169 | 8.111 | 155 | 7.465 |

According to the results of the calculations, the rating of the suitability of suppliers of material resources for SE "Arena Lviv" is as follows: ENGO LLC - 8.167 (172 points), AGROSTIS LLC - 8.111 (169 points), and AgroLux-Ukraine LLC - 7.465 (155 points).

The highest value of the integral criterion was obtained for ENGO LLC - 8.167, which indicates maximum compliance with the requirements of SE "Arena Lviv". If it is not possible to conclude an agreement with ENGO LLC, it is advisable to apply to AGROSTIS LLC, whose integral criterion is 8.111, which indicates full compliance with the requirements of SE "Arena Lviv".

Companies that follow modern marketing concepts pay considerable attention to building and maintaining their business reputation. Given that the reputation of a supplier can affect the reputation of an enterprise, it would be advisable to give preference to suppliers that, in addition to properly fulfilling their obligations, comply with the requirements of corporate social responsibility and have a positive reputation in society. Therefore, additional requirements for suppliers should be met [13]:

- all applicable laws, regulations, directives and industrial codes;
- ethical, labour, environmental, health and safety regulations;
- equal opportunities and non-discrimination policies;
- ensuring that the workplace is free from violations, including any type of discrimination;
- respect for cultural differences, worldviews and possible consequences related to the interpretation and application of these principles at the global level;
- raising awareness, empathy and social engagement that improve performance in the long term.

DISCUSSION AND CONCLUSION

The effectiveness of procurement marketing largely depends on the choice of suppliers of material and technical resources that best meet the requirements of the organisation that purchases them. When choosing suppliers, enterprises try to ensure the optimisation of costs associated with procurement while maintaining the required level of quality of the goods and services offered.

Given that in the current conditions, the activities of domestic enterprises are significantly affected by the conditions of uncertainty due to Russian aggression, it is advisable to consider several sources of supply of basic material and technical resources to ensure their functioning, which indicates the growing role of procurement activities. Based on the scientific works of Ivanova M., Dudnyk A., Yashkina H., Zaiets N., Karpenko Yu, and Starytskyi T. M. proposes a generalised algorithm of procurement activities of an enterprise, the main stages of which are: planning of the enterprise's activities in the market, determination of the need for material and technical resources, analysis of the market for material and technical resources, identification of possible suppliers of material and technical resources, selection of suppliers of material and technical resources, the conclusion of contracts and supply of material and technical resources, control and evaluation of the quality of procurement of material and technical resources, development of a plan for corrective actions.

In practical terms, to solve the problem of selecting suppliers, the most optimal approach is a multi-criteria approach, which allows a balanced approach to the selection of a supplier. The list of possible criteria is considered by a number of scholars, in particular, Krykavskiy Ye., Lopatin A., Kuznyak B., Valyavsky S., Reznik A., Novikova N. We propose to divide the criteria for selecting potential suppliers into three groups, namely, the economic status and business reputation of potential suppliers, characteristics of material and technical resources, terms of cooperation, and expand the list of criteria, in particular, it is advisable to take into account the presence of ties with the aggressor country and the reputation of partners of potential suppliers.

The study developed a scale for evaluating suppliers of material resources, which was used to select suppliers of the SE "Arena Lviv". The evaluation of suppliers according to the selected criteria was carried out by the method of direct evaluation with the involvement of experts - employees of the SE "Arena Lviv".

According to the results of the study, the rating of the suitability of suppliers of material resources for SE Arena Lviv is as follows (in descending order of suitability): ENGO LLC, AGROSTIS LLC, and AgroLux-Ukraine LLC. The highest value of the integral criterion was obtained for ENGO LLC, which indicates maximum compliance with the requirements of the enterprise, but if it is impossible to conclude an agreement with ENGO LLC, it is advisable to turn to AGROSTIS LLC, which also fully meets the requirements of SE "Arena Lviv".

The algorithm of organisation of procurement activities developed by the authors and the multi-criteria approach to the selection of suppliers proposed on its basis can be recommended for enterprises and organisations engaged in procurement activities.

The authors' further research will be aimed at developing measures to minimise risks in the procurement activities of enterprises under conditions of uncertainty.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ВИБІР ПОСТАЧАЛЬНИКІВ В УМОВАХ НЕВИЗНАЧЕНОСТІ ЯК СКЛАДОВА МАРКЕТИНГУ ЗАКУПІВЕЛЬ

Вибір постачальників матеріально-технічних ресурсів є одним із найважливіших рішень у маркетингу закупівель. Ефективні рішення щодо вибору постачальників є основою для створення бази джерел постачання. Метою дослідження є аналіз підходів до вибору постачальників матеріально-технічних ресурсів у маркетингу закупівель та обґрунтування напрямів підвищення його ефективності в умовах невизначеності.

З метою зваженого вибору постачальників автори запропонували алгоритм організації закупівельної діяльності та критерії оцінювання потенційних постачальників, обґрунтували використання багатокритеріального підходу, що дозволяє виважено обирати постачальника. Визначено основні критерії та шкалу оцінювання постачальників матеріальних ресурсів для ДП «Арена Львів», а також наведено результати їх експертного оцінювання.

Розроблений авторами алгоритм організації закупівельної діяльності й запропонований на його основі багатокритеріальний підхід до вибору постачальників може бути рекомендований для підприємств та організацій, які здійснюють закупівельну діяльність.

Ключові слова: маркетинг закупівель, постачання матеріально-технічних ресурсів, методи вибору постачальників, критерії вибору постачальників, метод попарних порівнянь, метод безпосередньої оцінки, інтегральний критерій вибору постачальників, ланцюги постачання

JEL Класифікація: M31, L83