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Review Paper

SELECTION OF SUPPLIERS IN THE SUPPLY CHAIN

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Abstract. *In recent decades, procurement has been defined as an integrated strategic business activity that aims to create high added value based on the focus company's relationship in the supply chain with its suppliers. The selection of suppliers in the supply chain is a complex task that should be performed in a cost-effective manner, taking into account the numerous requirements of business practice. The optimal supplier choice affects not only the product quality but also the formation of its price. The right choice of suppliers leads to timely, continuous and quality production. The decision on the choice of a supplier is a multi-criteria problem. A large number of models and techniques are used to make such a decision. The paper develops a framework to support decision-making and criteria-based prioritization of suppliers. The aim of this paper is to present the elements and specifics of the application of the Analytic Hierarchy Process as one of the multi-criteria decision-making techniques and SpiceLogic Ration Will software package as well as their relevance for supplier selection. In addition, based on the analyzed literature, the paper indicates the criteria used when choosing a supplier. The obtained results show that supplier 1 is the most important among the analyzed suppliers. The application of the SpiceLogic software package is justified, as the proposed package provides a platform for manufacturers to better understand the capabilities that sustainable suppliers must have in order to continue working with them and successfully manage the supply chain.*

Key words: *supplier selection, supply chain, AHP method, software package*.

JEL Classification: C02, C44, M11

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INTRODUCTION

One makes decisions every day, either out of habit (whether to drink coffee and go to lectures this morning or continue to sleep) or with the investment of great effort, time and money. Numerous and complex decisions lead to good business results. Making such decisions comes with uncertainty, which can have a decisive impact on the competitiveness and profitability of companies and their supply chains. Making adequate decisions requires a wide range of real information, the availability of which is variable to managers.

Today, there are a large number of scientific papers in which the conditions for calculating weight coefficients and supplier ranking are presented. The knowledge gained from these works can help company managers establish an adequate system for managing information, materials and services, from the supplier through the retailer to the end customer. In a large number of companies, the costs of raw materials and work-in-progress amount to 60-70% of the total cost of products. Supplier selection is one of the key management activities in the supply chain environment. It is important to establish long-term relationships with suppliers for continuous quality improvement, but also the reduction of procurement costs. Accordingly, business entities strive to find and establish relationships with suppliers who are financially stable, deliver goods on time, have high-quality goods that they sell at appropriate prices, because only an agile and optimal supply chain can lead to improved performance and profit on a turbulent market. However, this is not an easy task, so decision-makers use different criteria when selecting and evaluating suppliers, which they then assign weight factors that will affect the overall supplier performance. Today, a large number of software packages have been developed that are used for decision-making.

The aim of this paper is to select suppliers in the supply chain using secondary data and appropriate methods, but also to obtain recommendations on the reliability of the use of new software methods to increase productivity and efficiency of supply chain management. The structuring of decision-making problems and the evaluation of selected criteria is realized within the Analytic Hierarchy Process (AHP). After that, the model is tested using the previously mentioned software in order to confirm the obtained results and perform a sensitivity analysis.

The structure of the paper consists of three parts, conceptually and logically connected. The first part of the paper gives an overview of literature pointing to the importance of selecting suppliers in the supply chain. The methodology for applying the AHP method and the SpiceLogic Rational Will software package, which allows supplier selection, is given in the second part of the paper. The final part presents the results, recommendations and limitations of the model used.

1. LITERATURE REVIEW

The company's procurement activities affect its competitiveness and productivity. This activity is the most important part of the supply chain. Procurement managers evaluate supplier performance to retain those that meet company requirements. The selection of inadequate suppliers can cause operational and financial problems while by selecting adequate suppliers, the company reduces costs and solves quality problems.

As the company's procurement function accounts for "between 40% and 60% of final product sales, reducing these costs will increase the efficiency and profitability of the company" (Grzybowska & Gajdzik, 2014). For this reason, identifying relevant criteria for selecting suppliers is a key activity in supply chain management. The existence of suppliers who provide timely inputs of appropriate quality and who incur lower costs guarantees successful and long-term cooperation with the company (Hanlin & Hanlin, 2012).

By researching the academic literature, we come across different approaches when choosing the criteria for selecting suppliers. Dickson (1996) was the first to define the supplier selection criteria from the selected set. This author was the first to create a study on supplier evaluation in which he defined 23 criteria which he divided into four groups according to the degree of significance. The first group consists of criteria that are of *high importance*, and they are: quality, delivery, history of performance and guarantees and receivables policies. Production facilities and capacities, price, technical capabilities, financial capacity, procedural compliance, communication system, reputation and position in the industry, desire for work, management and organization and operational control are another group of criteria that are of *high importance* (Dickson, 1996). Criteria of *medium importance* are: repair service, impression of the supplier, ability to pack, records of labor relations, geographical location, number of completed jobs and training material, and they form the third group. Dickson attaches *little importance* to the fourth group of criteria, which consists of mutual arrangements.

Pal et al. (2013) note that the following criteria are used when selecting suppliers (Pal et al., 2013): price, quality, delivery, past business performance, warranty and receivables policy, production facilities and capacities, technical capability, financial capacity, reputation and industry position, desire for work, repair service, supplier access, packing ability, employment records, geographical location, amount of past loans and mutual arrangements.

Shukla (2016) points out that when choosing a supplier, one should rely on the criteria such as: cost, quality, delivery, reliability and flexibility. These criteria significantly affect business performance. Further selection and performance of each supplier implies that the baseline criteria are divided into sub-criteria. Shukla points out that the cost criterion affects the production flow. The goal is to create maximum benefit for the company during the procurement. The continuous improvement program, customer satisfaction, certificates and the percentage of timely deliveries describe the quality criteria. Poor quality negatively affects the company and can cause an increase in product return rates due to customer dissatisfaction. Delivery is especially important for products with a short life cycle. That is why product delivery time, from the place of origin to the destination, is crucial. Delivery includes: place of delivery, delivery time, total delivery time of the order and trade restrictions. A sense of trust, the political situation, price fluctuations and guarantee policies make for reliability. The feeling of trust varies from supplier to supplier and can be measured by quality and timely delivery. The last criterion that Shukla states is flexibility. Flexibility in the supply chain allows a company to cope with environmental uncertainties, changing demand and a new environment. Therefore, the capacity, availability of stocks, exchange of information, components of negotiations and adjustment of suppliers should be checked.

Growing trends in outsourcing and environmental and social protection require companies to integrate criteria that include economic, environmental and social elements in their supply chain activities (Ghayebloo et al., 2015).

Zimmer et al. (2016) analyze 143 articles published in the period from 1997 to 2014 and identify the following ten best economic, environmental and social criteria: "Economic criteria are: *quality; flexibility; price; delivery term; relationship; cost; technical capacity; logistical costs; reverse logistics; rejection rate;* Environmental criteria are: *environmental management system; resource consumption; ecological design; recycling; ecological impact control; energy consumption; reuse; air emissions and environmental code of conduct.* The third group includes social criteria: *stakeholder engagement; staff training; commitment in social management; commitment to health and safety management; stakeholder relations; code of social conduct; donations for sustainable projects; rights of interested parties; safety practices and annual number of accidents."* In addition to these, Gahona-Flores (2021) points out that they are highly valued as ecological criteria for health and environmental management (Gahona-Flores, 2021).

Integrating selection criteria allows companies to move towards sustainable development. There should be a positive relationship between sustainable supplier selection and supply chain, as this is the right path leading to sustainable supply chain management (Seuring & Muller, 2008). Due to the discrepancy between sustainability regulations and legislation and the organizational goals of the company, the sustainable selection of suppliers becomes a complicated decision (Zimmer et al., 2016). Therefore, research should be conducted in order to select the best suppliers or suppliers who can meet the requirements manufacturers set as criteria for the sustainability of supply chain management.

Different methods of multi-criteria analysis can be used when ranking suppliers based on the selected criteria. Govindan et al. (2015) review literature and recommend the Analytic Hierarchy Process, also suggesting combining the AHP method with other methods in order to better solve the problems that may arise.

Handfield et al. (2002) use the AHP method to assess suppliers and environmental performance. In addition to the standard AHP method and other mathematical measures, Lee et al. (2009) apply fuzzy logic involving AHP. Chan & Kumar (2007) show that cost and price are the most important criteria when selecting suppliers using the AHP-fuzzy method. Kumar et al. (2018) use the AHP method in their study and take into account costs, ability to deliver, product quality, performance and reputation of the firm when choosing a supplier.

Based on the analyzed literature, it can be clearly seen that the choice of criteria for the selection of suppliers is important and has a decisive influence on the company efficiency. The choice of criteria depends on the activity and the company status. Also, we can conclude that criteria such as quality, cost and delivery time are still of high importance for the selection of suppliers. In addition to these criteria, in the twentieth century, the communication system, method of payment, logistics capacity, supplier audit, etc. are gaining in importance, because the daily company goals require the use of integrated approaches that involve a number of factors and criteria. If there are critical areas, it is necessary to conduct a more detailed analysis and assess the capabilities of suppliers.

2. Research Methodology

Analytic Hierarchy Process (AHP) is one of the best-known methods of multicriteria decision-making used to determine the relative importance of a set of attributes, activities, or criteria. The creator of this method is Thomas Saaty. It allows for a comparison of alternatives based on decision assessment, taking into account the importance of the criteria. The AHP method belongs to the class of methods for soft optimization. AHP is often used in solving various problems. Vaidya and Kumar (2006) give a good overview of AHP applications. In addition to the possibility for decision-makers to structure the problem in a clear and simple way, the AHP method also allows the inclusion of objective and subjective consideration when making decisions (Forman, 1983). The process of using the AHP method consists of four phases (Suknović & Čupić, 2003, p. 175):

1. Structuring the problem.
2. Data collection.
3. Estimation of relative weights.
4. Determining the solution to the problem.

The first phase consists of decomposing any complex decision problem into a series of hierarchies, where each level represents a smaller number of attributes (Suknović & Čupić, 2003). The attributes are then decomposed into another set of elements corresponding to the next level. So, at the top of the structure is the goal, and at the lower levels are the criteria and sub-criteria. The alternatives to be assessed are at the lowest level (A1, A2 and A3). The comparison of each pair for each criterion is presented in Figure 1. If there are n elements for comparison then the total number of n (n-1) / 2 estimates needs to be made, because each alternative in relation to itself is represented by the number 1 and those units are set diagonally, and values below the diagonal represent reciprocity. All participants should be involved in defining the hierarchy, because there are different views of the problem, which may be more useful than the ones we originally posed (Clark, 1985). In our example, we will compare three alternatives (suppliers) based on seven criteria. So, we have a total of 21 comparisons (7*(7-1)/2).

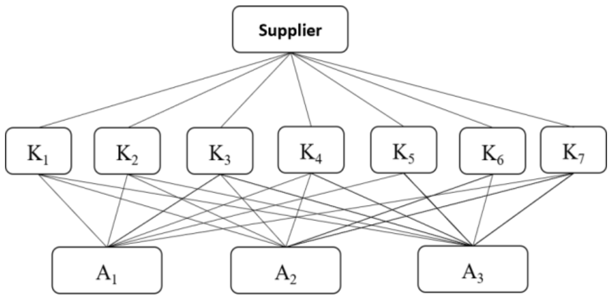

Fig. 1 Hierarchical structure of decision problems
Source: Adapted from: Srđević, B. & Jandrić, Z. (2000). Analitički hijererarhijski proces u strateškom gazdovanju šumama. Novi Sad: J.P. „Srbija šume“, *Šumsko gazdinstvo* "Novi Sad".

The second phase refers to data collection and comparison of pairs of alternatives. The decision-maker assigns relative grades in pairs of attributes of one hierarchical level for all levels of the entire hierarchy attributes (Suknović & Čupić, 2003). In order to perform a relative weight estimation in which the comparison matrix is translated into eigenvalue problems, the best known Saaty nine-point scale is used to obtain normalized and unique weight vectors for all attributes at each level of the hierarchy (Kousalya et al., 2012). Level of preference 1 shows that two alternatives are completely equal, while the absolute advantage of one over the other alternative exists when we assign the number 9 to the pair. Thus, the decision-maker can express his opinion on each pair of elements as: equal importance, slightly higher importance in relation to the other, greater importance, significantly greater importance and absolutely greater importance of one element in relation to another. Descriptive grades are converted into numerical values: 1, 3, 5, and 7, while the numbers 2, 4, 6 and 8 are between them and are used to more accurately express the limit values in case the decision-maker hesitates between two levels.

In the third phase, we determine the relative significance of the criteria, form a matrix A of dimension nxn (criterion level) and mxn (alternative level), where the elements $a_{ii}=1$ (elements of the main diagonal), while the elements a_{ji} are reciprocal values a_{ij} for i are different j, i,j = 1,2, … ,n. In order to be able to obtain our own vectors at this stage, it is necessary to (Despodov et al., 2011):

- Compare the criteria in pairs.
- Find the sum of all the elements in each column.
- Divide the elements of each column by the sum of that column we obtained in the previous step.
- Find the sum of all elements in each row and then determine the mean value of each row (divide the sum by the number of criteria). The column consisting of the mean values thus obtained represents the normalized eigenvector. In this way, the participation or importance of each criterion in the model is obtained.

Determining the problem is actually finding a composite normalized vector (**fourth phase**). When determining the vector of order of values in the criteria in the model, it is necessary to determine the importance of alternatives in the model. After evaluating the alternatives according to individual criteria, we perform an overall synthesis of the problem in which we need to multiply its participation within the criteria with the relative weight of the criteria for all criteria, and then add the obtained values for each alternative separately. By adding these values, the total shares are obtained, i.e. weights for each alternative, thus determining the composite normalized vector. The ranking of alternatives is done on the basis of the values of total weights so that the highest rank is given to the alternative with the highest total weight. Therefore, in this case, we conduct an evaluation of alternatives based on all criteria. Each alternative gains its value.

Finally, each pair comparison should pass a consistency test. Satty suggests that the consistency index be calculated as follows: $CI = (\lambda max - n) / (n - 1)$. The obtained index can be compared with randomly selected indices (RI) and we get the consistency ratio (CR). A CR value less than or equal to 0.1 is considered significantly consistent.

In addition to the standard method of application, the AHP methodology can be implemented using software packages. Software packages as decision support systems aim to help managers apply analytical methods to make an adequate decision. They enable very easy interpretation, visualization and interactivity of different solution scenarios. There are various software solutions (Expert Choice, Super Decisions…). We decided to implement SpiceLogic Rational Will. This software solution is based on the AHP model. It is very easy to use. The program allows us to choose whether to maximize or minimize the criterion (drop-down menu). We repeat the process until we enter the desired number of criteria. When we do not use quantitative data but express a subjective comparison in pairs, the “subjective” option should be chosen.

We compare pairs using a scale. We respect a consistency relationship that measures inconsistency between pairs. It shows us how much we “violate” the rule of transitivity. When this rule is applied or when we are 100% consistent in our preferences, the deviation will be 0. The higher the number, the greater the deviation. According to Satty, as we mentioned, the consistency ratio (CR) should be less than or equal to 10%. If it exceeds this value, the software warns us that the number turns red and then we have to revise the comparison.

Based on the explained methodology, preference should be given to the SpiceLogic software package due to: time savings when comparing criteria, easier modification of entered data, and more detailed sensitivity analysis.

3. Results and Discussion

The procurement process plays an important role in the operations of manufacturing and service companies. Companies order and buy different categories of raw materials, work-in-progress and finished products. Procurement must be efficient, because it significantly affects the profitability and competitive position of the company.

Proper selection of suppliers affects the efficiency of procurement and is a multi-criteria problem that includes quantitative and qualitative criteria. When choosing the right supplier, it is important to establish a balance between tangible and intangible criteria. Companies evaluate potential suppliers using a number of criteria, to which they assign different weighting factors whose values ultimately affect the overall performance of the supplier.

In this paper, we base the selection of suppliers in the supply chain on the AHP method, the results of which we test using the SpiceLogic Rational Will software package. We collect data for the research from various secondary sources, but primarily from published publications in the automotive industry (data by Hruška et al., 2014). We present the first phase of the AHP method in the second chapter (Figure 1). In this way, we decompose the decision-making problem in the form of a hierarchical structure. At the top of the hierarchy, we have a decision on the choice of supplier that represents the goal. The next level refers to the criteria, while at the lowest level of the hierarchy there are alternatives (in our case three suppliers) that are evaluated in relation to the defined criteria and goal.

The mentioned authors reach the data with the help of research conducted in the automotive industry and rank suppliers based on nine criteria, while for this paper we selected seven criteria: price, product quality, payment deadline, delivery time, storage space, transport and audit of suppliers (Table 1).

Table 1 Supplier selection criteria

Mark	Criterion
K_1	Price
K_2	Product quality
K_3	Payment deadline
K_4	Delivery time
K_5	Storage space
K_6	Transport
K_7	Supplier audit

Source: Adapted from: Hruška, R., Průša, P. & Babić, D. (2014). The use of AHP method for selection of supplier. *Transport*, 29(2), p. 200.

After the defined hierarchical structure, a comparison of pairs of criteria follows (third phase). If, when comparing, one criterion is assigned a higher number than the other, it means that we prefer the first criterion. The comparison of pairs is presented in the form of a square matrix using a comparison scale that provides information on the preferences of the criteria. We synthesize the information to show a general preference (we actually get a vector of the eigenvalues of the matrix). The eigenvector vector of the matrix is shown in Table 2.

Table 2 Matrix eigenvalue vector

	K_1	K_2	K_3	K_4	K_5	K_6	K_7
K_1	1	2	3	3	3	4	3
K_2	1/2	1	2	3	3	4	5
K_3	1/3	1/2	1	2	2	3	4
K_4	1/3	1/5	1/2	1	3	2	3
K_5	1/3	1/3	1/2	1/4	1	3	3
K_6	1/4	1/4	1/3	1/2	1/3	1	2
K_7	1/3	1/5	1/4	1/3	1/3	1/2	1
SUM	3.07	4.48	9.08	8.58	15.33	14.83	21.00

Source: Adapted from: Hruška, R., Pruša, P. & Babić, D. (2014).
The use of AHP method for selection of supplier. *Transport*, 29(2), p. 200.

Then we divide each element of the matrix by the obtained sum of the column in which it is located and perform summation by rows of the table, and after that we calculate the average value by alternative to get to the normalized sum of rows. The obtained average value represents the average preference (weight coefficient) of one alternative over the others. Based on the calculation, we arrive at the weighting coefficients: w_1= 0.29 (price); w_2= 0.24 (product quality); w_3= 0.13 (payment deadline); w_4= 0.13 (delivery time); w_5= 0.07 (storage space); w_6= 0.09 (transport) i w_7= 0.05 (supplier audit). We calculate the maximum eigenvalue of the comparison matrix, i.e. λmax by multiplying the matrix of comparison results by the priority vector, i.e. the values from Table 2 are multiplied by the weighting coefficients (multiplication is performed in accordance with the rule of multiplication of the matrix and vector).

The resulting vector is now divided by the values of the weighting coefficients to determine λmax. In our example, λmax is 7.57 ($\lambda_{max} =$ (7.83+7.73+7.85+7.57+7.46+7.84+6.75)/7=7.57)

In order to determine the consistency index (CI), we must first determine the degree of consistency (CR) based on the Saaty table (1980). The random index for the 7x7 matrix is 1.32 (The value is below 0.1, which shows us that we meet consistency criterion and there is no need for data review).

$$CI=\frac{\lambda max-n}{n-1}=\frac{7.57-7}{7-1}=\frac{0.57}{6}=0.095$$

$$CR=\frac{CI}{RI}=\frac{0.095}{1.32}=0.072$$

After fulfilling the conditions of consistency in the criteria, we continue the procedure of applying the AHP method when comparing suppliers (for each of the criteria) in order to multiply their weight coefficients and weight coefficients of the criteria to reach the weighted amount based on which we rank suppliers (fourth phase). By the priority order of alternatives (Supplier 1, Supplier 2 and Supplier 3) as a lower-level element, i.e. in relation to the criteria, we can see the relative importance of the given criterion for each of the alternatives when making the final decision on the selection of suppliers in the supply chain. We conclude that Supplier 1 meets the criteria (has the highest value of the weighted amount), and the management should opt for it.

Table 3 Ranking of alternatives

Alternative	Weighted amount	Ranking
Supplier 1	0.473652	1
Supplier 2	0.424006	2
Supplier 3	0.102341	3

Source: Authors' calculation

The SpiceLogic software package suggests Supplier 1 as a recommendation for the selection of suppliers in the supply chain based on the entered values, because its total priority is 59.16%, followed by Supplier 2 with an overall priority of 49.53% and finally Supplier 3 with 49.07%. The presentation is given in the form of a bar graph and a radar panel.

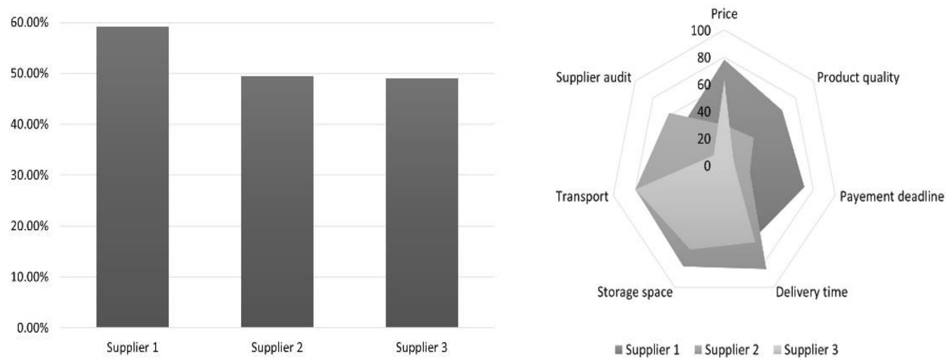

Fig. 2 Solutions obtained using the SpiceLogic Rational Will software package
Source: Authors' calculation using SpiceLogic Rational Will software package

The final decision on the choice of supplier should not be made before conducting a sensitivity analysis. Sensitivity analysis allows us to understand how "firm" our decision is. The software package provides one-way sensitivity analysis and as a result displays a graph of the change in the value of the variable that affects the value of the option. Based on the sensitivity analysis (Sensitivity index = 100 - Ks % (measures the distance that a variable needs to influence a decision). As the value of the weight of the comparison side changes from its total possible value, so will the total value of the other side decrease) in this example, this decision was influenced by the following criteria, which were compared according to the index of importance (from highest to lowest importance): payment deadline, product quality and price (Figure 3). The product quality criterion has a sensitivity index of 31.63%. The higher the index, the higher the sensitivity. If the sensitivity index is zero, the variable is insensitive in that decision context.

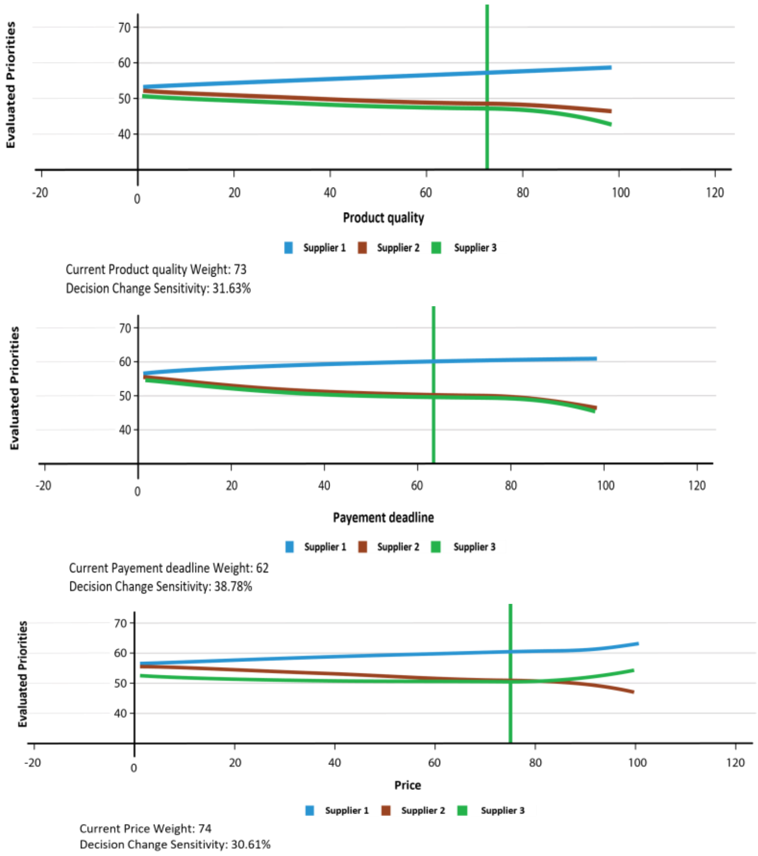

Fig. 3 Sensitivity analysis

Source: Authors' calculation using SpiceLogic Rational Will software package

Making rational decisions requires analyzing the data, which requires time and makes the method unsuitable for quick decision making. Rapid changes on the market require rapid decision-making, so this model can be used mainly in making long-term decisions, rather than short-term or operational ones. Disadvantages when using the software package can occur when management cannot define and assess the problem. In that case, the decision-maker does not have relevant information that would be of help to him, so he uses his experience and instinct when making decisions, and then subjectivity comes to stage. Rational decision-making requires management to have relevant information in the supplier evaluation phase. In addition to the time constraint, the limiting factors may be: lack of financial resources, misinterpretation of data, and insufficient knowledge of the application of software tools.

CONCLUSION

Evaluation and selection of suppliers in the supply chain are activities that companies face on a daily basis. Businesses are often unable to make adequate decisions and therefore have to use appropriate methods and software packages. Analytic hierarchy process is a system that has proven to be a very reliable basis for decision-making because it allows users to rank potential alternatives based on subjective assessments of criteria.

In this paper, we present the gradual application of the AHP method when selecting suppliers in the supply chain. The only thing we can point out as a disadvantage in its application is the definition of decision criteria and assessment of their relative weights. This is so because with other multi-criteria analysis methods the importance of the criteria is determined by the decision-maker, and here we have a comparison of pairs that represent human decisions based on experiences from previous research. Only after the comparison is a decision made.

Globalization of business, shortened product life cycle, constant growth of competition, but also the penetrating and increasingly present development of information and communication technologies have led to the development of the AHP method. The AHP method has gained in importance with the development of quality software. Different software packages solve multi-criteria ranking and enable the use of sensitivity analysis.

In this paper, we perform a multi-criteria selection of suppliers in the supply chain using the AHP method, but also the software package, in order to examine the importance and usability of computer tools. We analyzed three suppliers based on seven criteria and came to the following results:

- The criterion with the greatest importance for the company is the criterion K1 - price with a score of 0.29, while the least attention when making decisions is paid to supplier audit (K6) - 0.05. Using SpiceLogic Rational Will software, the three most important criteria are defined in the following order: payment deadline, product quality and price. Sensitivity analysis shows that there are changes (differences) in the weight of the criteria, but this did not affect the overall ranking when it comes to the position of the best alternative. We can conclude that the existence of a slight inconsistency in the weight of the criteria does not affect the overall system and the final decision.
- By comparing suppliers based on each of the criteria, we conclude that the AHP method and the SpiceLogic Rational Will software solution give the same results. Recommendation for the selection of suppliers in the supply chain according to the software package is Supplier 1 (59.16%), then Supplier 2 (49.53%) and finally Supplier 3 (49.07%).

Based on all the above, we conclude that the company is free to choose Supplier 1 as the optimal choice with full confidence and that in its business it can rely on the proposed software package.

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IZBOR DOBAVLJAČA U LANCU SNABDEVANJA

Poslednjih decenija, funkcija nabavke definiše se kao integrisana strateška poslovna funkcija koja ima za cilj stvaranje visoke dodatne vrednosti zasnovane na odnosu fokusne kompanije u lancu snabdevanja sa svojim dobavljačima. Izbor dobavljača u lancu snabdevanja je složen zadatak koji treba izvršiti na troškovno efikasan način i uz uvažavanje brojnih zahteva poslovne prakse. Optimalan izbor dobavljača utiče ne samo na kvalitet proizvoda već i na formiranje njegove cene. Pravilnim izborom dobavljača postići će se pravovremena, kontinuirana i kvalitetna proizvodnja. Odluka o izboru dobavljača predstavlja višekriterijumski problem. Za donošenje takve odluke koristi se veliki broj modela i tehnika. Rad se bavi razvojem okvira za podršku prilikom odlučivanja i određivanja prioriteta dobavljača na osnovu kriterijuma. Cilj rada je da prikaže elemente i specifičnosti primene Analitičkog hijerarhijskog procesa kao jedne od tehnika donošenja odluka sa više kriterijuma i softverskog paketa SpiceLogic Ration Will kao i njihovu relevantnost za izbor dobavljača. Pored toga, rad na osnovu analizirane literature ukazuje na kriterijume koji se koriste prilikom izbora dobavljača. Dobijeni rezultati su pokazali da je dobavljač 1 najvažniji među analiziranim dobavljačima. Primena softverskog paketa SpiceLogic je opravdana, jer predloženi paket pruža platformu za proizvođača da bolje razume sposobnosti koje održivi dobavljači moraju da poseduju kako bi nastavili saradnju sa njima i uspešno upravljali lancem snabdevanja.

Ključne reči: *izbor dobavljača, lanac snabdevanja, AHP metod, softverski paket.*