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SUPPLIER SELECTION IN INSTITUTIONS OF RESIDENTIAL CARE

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Review paper

Abstract: The selection of suppliers in public procurement significantly impacts economic efficiency and social wellbeing, particularly within residential care institutions responsible for vulnerable populations. Despite the strategic importance of procurement decisions, limited research has addressed criteria weighting in the specific context of residential care. This study bridges this gap by applying the group Analytic Hierarchy Process (group AHP) to determine the weights of selected procurement criteria in residential care institutions in Serbia. Results indicate that price remains the dominant factor, though sustainability considerations are increasingly influential, aligning procurement practices with broader regulatory and policy goals. Moderately weighted criteria emphasize the importance of contractual clarity and fairness, while delivery time is found to be of comparatively lower priority. The application of group AHP demonstrates strong consistency among expert judgments, highlighting its effectiveness in enhancing transparency and reducing potential biases or corruption. The findings underscore the necessity of embedding scientifically grounded multi-criteria approaches into public procurement frameworks and suggest comprehensive training for procurement professionals to facilitate informed, sustainable, and socially responsible procurement decisions.

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1. Introduction

In today's modern era, the selection of suppliers holds significant importance as it has a profound and long-term economic impact on both business effectiveness and social wellbeing. The need to reduce public spending in this area is evident, considering that public sectors allocate a substantial portion, averaging 45-65%, of their budgets to public procurement (Bratt et al., 2013). Simultaneously, residential care plays a vital role in providing assistance to individuals who are unable to live independently, making it an integral part of the social welfare system (Feng et al., 2020). Given that residential care institutions fall under the purview of public authorities, it becomes imperative to consider social wellbeing during the process of public procurement (Torfing et al., 2019). It is essential for procurers to make decisions that offer the best value for the money, as the funds for public procurements are derived from taxpayers' contributions, which serve as a crucial source of budget financing (Wang et al., 2020).

The criteria for assessing the object of public procurement, along with their relative importance, are determined by the tender commission based on the physical and technical characteristics of the procurement item (Law on Public Procurement, 2019). The tender document should clearly outline the content, measurement, and relative importance (weights) of each criterion. The determination of criteria weights holds significant importance in the public procurement process (Sönnichsen & Clement, 2020), as they heavily influence the final supplier selection. It is essential to prevent any potential bias or distortions of competition that may arise from the manipulation of criteria weights, as such corrupt behaviour can undermine social wellbeing. Thus, the weight determination process should be guided by scientific methods to ensure fairness and transparency.

The supplier selection problem can be viewed as a classic multi-criteria problem, where the procurer must evaluate multiple suppliers based on different criteria. To support decision-making in public procurement, the application of multi-criteria decision-making methods can be considered (Dotoli et al., 2020). Multi-criteria decision-making involves decision-making in scenarios with several alternatives characterized by conflicting criteria. The criteria are represented as functions, and their significance is indicated by weights. However, determining the weights for each criterion can be challenging, as they do not have inherent economic meaning but significantly impact the final decision. The role of weights is to demonstrate the relative importance of each attribute in relation to others. Therefore, the evaluation and assignment of weights play a critical role in the multi-criteria decision-making process. Precise weight coefficients are necessary to accurately depict the contribution of each criterion to the defined objective.

The existing literature highlights substantial research on public procurement methodologies; however, limited attention has been dedicated explicitly to residential care institutions, particularly regarding the determination of weights in

supplier selection criteria. This paper bridges this gap by applying a structured scientific method to procurement processes specifically within gerontology centers and institutions for adults with severe mental disorders in Serbia. This setting underscores both the unique challenges of care provision and the need for accountability in public procurement (Xu & Zhang, 2021). The primary objective is to scientifically determine appropriate weighting coefficients for procurement criteria, emphasizing the importance of a structured and transparent procurement process. This paper highlights the substantial impact that effective public procurement practices have on social and economic wellbeing, underscoring how rigorous multi-criteria methodologies can mitigate risks of misuse and corruption.

A key premise of this research is that complex decision-making involving multiple alternatives and diverse evaluation criteria can significantly benefit from scientifically grounded methods. Among the various methods available, the group Analytic Hierarchy Process (AHP) has been selected due to its widespread acceptance in contemporary literature, ease of use, and reliability in achieving robust outcomes. AHP facilitates converting subjective expert assessments into quantitative weightings, providing greater transparency and objectivity.

The remainder of the paper is structured as follows. Following the introductory discussion on the importance of supplier selection within residential care institutions, the second section provides a comprehensive theoretical background and a review of relevant literature concerning public procurement systems, multi-criteria decision-making methods, and the challenges related to weight determination. The third section elaborates on the methodological framework, specifically detailing the application of the AHP, the selection and justification of criteria, and the procedure for aggregating expert judgments. Subsequently, the fourth section presents and discusses the empirical results derived from applying group AHP in residential care procurement in Serbia. Finally, the paper concludes with key findings, policy recommendations, implications for practice, and suggestions for future research.

2. Theoretical background

Given the long-term nature of demographic changes, public procurement processes need to be forward-looking, incorporating sustainability and long-term planning to ensure that residential care institutions are prepared to meet future demands (Klingler, 2020). Pejin Stokic and Bajec (2018) stat that the demographic projections for Serbia indicate that by 2030, more than 25% of the population will be aged 65 or older, with a notable percentage being 75 or older (17.4%). As the population ages, the demand for residential care services will increase due to the rising number of dependent elderly individuals who require formal care. Efficient public procurement processes will be crucial to ensure that residential care

institutions can meet this growing demand by securing the necessary resources, services, and infrastructure to accommodate an aging population. Furthermore, effective public procurement is crucial in enabling governments to achieve their strategic objectives, manage their economies efficiently, and ensure the security and prosperity of their citizens (Ambe, 2019).

Considering that the United Nations Sustainable Development Goal (SDG) 12 focuses on ensuring sustainable consumption and production patterns, one of its critical sub-objectives, 12.7, specifically emphasizes the promotion of sustainable public procurement practices. This sub-objective encourages governments to adopt and implement procurement strategies that align with national policies and priorities, thereby ensuring that public procurement not only meets immediate economic and operational needs but also contributes to broader sustainability goals (Hamilton, 2022). The importance of efficient public procurement is reflected in a fact that governments are navigating through uncertain times, facing complex decisions in managing their economies and ensuring the security and well-being of their citizens (Pircher, 2020). Public procurements, through which governments and public sector institutions acquire goods, services, and works from private companies or organizations, serve as a critical mechanism for to achieve strategic objectives such as economic development, job creation, and infrastructure growth. The proportion of public procurement relative to GDP serves as a key indicator of the potential for economic growth and development facilitated by government purchasing activities. In the European Union, public procurement accounts for approximately 14% of GDP, underscoring its significant role in driving economic development (European Commission, 2024). In comparison, the share of public procurement in GDP in the Republic of Serbia reached its highest level of 10.5% in 2023, reflecting the growing importance of public procurement in the national economy (Office for Public Procurement of the Republic of Serbia, 2024). Moreover, 97% of public purchases in Serbia are conducted based on the criterion of the lowest bid price, prioritizing the acquisition of the cheapest goods and services. Only 3% of procurements utilize the criterion of the most economically advantageous offer, which takes into account both price and quality (Office for Public Procurement of the Republic of Serbia, 2024). According to the Corruption Perceptions Index (2024), in 2023 Republic of Serbia ranked 104th out of 180 countries, with a score seven points below the global average and 28 points below the European Union average. This ranking underscore the urgent need for Serbia to address corruption and irregularities in its procurement system to restore trust within the economy and enhance the effectiveness of public procurement processes.

A fundamental prerequisite for developing an efficient and non-discriminatory public procurement system is the establishment of accountability and oversight. However, establishing such systems in the public sector presents far greater complexity and challenges than in the private sector. Public procurement processes vary across countries, particularly in terms of the methods used for conducting

tenders and selecting the most suitable bidders, the communication procedures involved, and the roles and responsibilities of those participating in the procurement process. These variations reflect the diverse legal and institutional frameworks governing public procurement, which can significantly influence its efficiency and effectiveness.

In accordance with the public procurement regulations in the European Union (Directive 2014/24/EU) and Serbia (Law on Public Procurement, Official Gazette of the Republic of Serbia, No. 91/2019), the Most Economically Advantageous Tender (MEAT) is regarded as the standard criterion for tender selection in Serbia. The Serbian Law on Public Procurement applies to contracts for public works, supplies, services, and concessions awarded by contracting authorities, as well as other entities, including state, regional, or local authorities, and public enterprises. Under this law, contracts are awarded to the bidder offering the MEAT, determined based on one of the following criteria: (1) price, (2) costs using a cost-efficiency approach, such as life cycle cost analysis, or (3) a combination of price or cost and quality. The quality assessment is based on various factors, including qualitative, ecological, and social aspects related to the subject of the procurement. These criteria may include: (a) Quality, encompassing technical, aesthetic, and functional features, availability, universal design, social, environmental, and innovative attributes, as well as trade conditions; (b) The organization, qualifications, and experience of the personnel responsible for executing the contract, particularly when the quality of personnel can significantly impact the successful performance of the contract; (c) After-sales service and technical support, along with delivery conditions, such as the delivery date, process, and timeline, or performance duration.

Thus, the selection of the best tender is inherently a multicriteria decision-making problem, as it involves evaluating multiple factors to ensure the best value for public resources.

Marcarelli and Nappi (2019) highlight several issues that can emerge during the public procurement process, one of which is corruption in the weighting of evaluation criteria. This type of corruption can result in the manipulation of the procurement process by assigning disproportionately high weights to specific criteria that only a favoured bidder can fully meet. Such practices undermine the fairness and transparency of the process, leading to biased outcomes that do not necessarily reflect the most economically advantageous tender or the best value for public resources. To address this issue, several researchers have suggested the application of multi-criteria decision-making (MCDM) methods in the public procurement process (Dobi et al., 2010; Mimović & Krstić, 2016; Dotoli et al., 2020). These methods provide a structured framework for evaluating tenders based on multiple criteria, ensuring a more transparent and objective selection process. To demonstrate the advantages of applying MCDM methods in public

procurement, this paper focuses on the process of weight determination using the example of residential care institutions in the Republic of Serbia.

3. Methodology

In the multi-criteria model used for evaluating public procurement, the alternatives are represented by the bids received from various bidders in response to a specific procurement request from a contracting authority. Each bid possesses distinct characteristics, which correspond to attributes that reflect the value of certain criteria for that particular bid. These attributes indicate the level of fulfilment for each criterion. The criteria in the multi-criteria model serve as the basis for evaluating the alternatives, with the recognition that not all criteria carry equal weight in the decision-making process (Popović et al., 2015). The significance of the multi-criteria model is expressed through the weighting coefficients, which reflect the relative importance of each criterion.

Many methods in multi-criteria analysis require precisely determined weighting coefficients to solve decision problems effectively. The accurate determination and assignment of these weights are crucial, given that the weighting coefficients significantly influence the final ranking of alternatives, ultimately determining the selection of the most suitable solution. Therefore, careful attention to the weighting process is essential to ensure an objective and transparent decision-making process in public procurement.

3.1. The Analytic Hierarchy Process

Public procurement processes often involve complex decision-making scenarios where multiple criteria need to be evaluated to select the most suitable supplier or service provider. The Analytic Hierarchy Process (AHP) serves as an effective tool for addressing this complexity by providing a structured approach to decision-making. The core of this method involves pairwise comparisons, which help establish a prioritized list based on the relative importance of the criteria involved. The decision-making problem is systematically decomposed into a hierarchical structure, typically comprising three levels. At the top of the hierarchy is the overall goal that the decision seeks to achieve. The second level consists of the criteria used to evaluate the available alternatives, which are placed at the third and lowest level of the hierarchy.

The hierarchical breakdown of the problem is essential, as it allows decision-makers to evaluate the relative importance of elements within the same level concerning those at a higher level (Saaty & Vargas, 2013). The AHP process is typically conducted in four phases:

1. Structuring the Problem: This involves defining the decision problem and establishing a clear hierarchical structure.
2. Data Collection: Gathering the necessary information and data to perform the pairwise comparisons.
3. Evaluation of Relative Weightings: This phase focuses on comparing the elements to determine their relative importance.
4. Determination of Problem Solutions: Using the derived weightings to evaluate the alternatives and reach a decision.

The strength of AHP lies in its ability to allow decision-makers to organize complex decision problems into a structured hierarchy, making it easier to analyse and make informed decisions (Tahriri et al., 2008).

The AHP is a measurement technique that addresses both quantitative and qualitative indicators, making it widely applicable in decision-making theory and conflict resolution. This method facilitates the decomposition of complex problems into a hierarchical structure, allowing for a comprehensive evaluation that includes both qualitative and quantitative aspects. The evaluation process is carried out through systematic pairwise comparisons, wherein the opinions of decision-makers are elicited and analysed (OECD & JRC, 2008).

AHP operates on the principle that in decision-making, the experience and knowledge of people are at least as valuable as the data they utilize (Vargas, 1990). This method is particularly effective in contexts where subjective judgments need to be integrated with objective data, ensuring that both are given appropriate consideration in the decision-making process.

One of the fundamental properties of the AHP method is that the weight coefficients derived from the process represent a compromise between indicators, reflecting the trade-offs decision-makers are willing to make between them. These coefficients are not merely importance weights but are reflective of the willingness to substitute or compensate one indicator for another within the decision-making framework. The core of the AHP method involves pairwise comparisons of indicators. In these comparisons, decision-makers assess the relative importance of each pair of indicators, determining which of the two is more important and by how much. Preferences are expressed using a semantic scale ranging from 1 to 9, where a preference of 1 signifies equality between two indicators, and a preference of 9 indicates that one indicator is extremely more important than the other (as illustrated in Table 1).

The results of the AHP analysis are presented in a comparison matrix, where the number of comparisons required for a matrix of order *n*, with *n* being the number of elements compared, is calculated as $\frac{n(n-1)}{2}$. This is because the elements of the matrix are reciprocals of one another with respect to the main diagonal (Saaty, 1987).

Table 1. Scale of relative importance

Value	Definition
1	Equal importance
3	Weak importance
5	Strong importance
7	Demonstrated importance
9	Absolute importance
2, 4, 6, 8	Intermediate values

Source: Saaty, 1990

To ensure the reliability of these comparisons, a measure of consistency, often referred to as the consistency ratio or coefficient of inconsistency, is introduced. This measure is crucial because, despite the expertise of the panel, experts may exhibit inconsistencies in their judgments. For example, if a_{ij} represents the preference of indicator *i* over indicator *j*, and a_{jk} represents the preference of indicator *j* over indicator *κ*, then a_{ik}, the preference of indicator *i* over indicator *κ*, should ideally be equal to $a_{ij}a_{jk}$ for the comparisons to be consistent. However, some degree of inconsistency is tolerated, provided that the consistency measure does not exceed 0.1.

The AHP method is versatile and has been successfully applied to a broad spectrum of decision-making scenarios, ranging from simple personal choices to complex, high-stakes decisions involving significant capital investment. The widespread success of the AHP method is attributable to its simplicity and robustness, making it accessible and effective in various contexts.

The AHP method is grounded in a set of axioms that underpin its operation and validity (Vargas, 1990):

1. Reciprocal Comparison: If element A is preferred to element B, the reciprocal holds; B is less preferred compared to A.
2. Homogeneity: The elements being compared should be of similar order of magnitude, ensuring that the comparisons are meaningful and consistent.
3. Independence: The criteria and alternatives should be independent of one another within the hierarchy.
4. Expectation: Decision-makers should expect to evaluate all pairwise comparisons independently, without the influence of previous comparisons.

These axioms support the rigorous application of AHP, ensuring that the method provides consistent, reliable, and replicable results across a wide range of decision-making contexts.

If Axiom 1 is not fulfilled, it indicates that the object of comparison is either unclear or improperly defined. This lack of clarity can lead to unreliable or inconsistent comparisons, undermining the validity of the decision-making process. Axiom 2 addresses the issue of homogeneity; if this axiom is not satisfied, the problem being evaluated may lack uniformity, making it difficult to comprehensively assess the various elements involved. This inhomogeneity can prevent a meaningful evaluation and comparison of alternatives.

Axiom 3 emphasizes the necessity for the weight coefficients of the indicators to be independent of the observation units. If this axiom is violated, it suggests that the indicators are not being evaluated objectively, potentially leading to biased or skewed results. Finally, Axiom 4 highlights the importance of considering all relevant indicators and observation units. Failure to satisfy this axiom means that some indicators or units have been overlooked, leading to an incomplete decision-making process based on the pairwise comparisons.

The weight coefficients of indicators derived through the AHP method are generally less prone to errors compared to other participatory methods. This robustness is largely due to the built-in evaluation of consistency within the pairwise comparison process. However, despite its widespread use and popularity as a technique for determining indicator weightings, the AHP method is not without its limitations, which are common to all participatory techniques. For instance, when the number of indicators is large, the process requires a significant number of pairwise comparisons. This can impose considerable cognitive stress on experts, increasing the likelihood of inconsistencies in their judgments (Greco et al., 2019). Nevertheless, thoughtful application and ensuring that the axioms are adhered to can mitigate some of these challenges, leading to more reliable and valid outcomes.

3.2. Group AHP

The importance, or weight, assigned to each decision maker in group decision-making is a crucial and often sensitive aspect (Dong & Cooper, 2016). Typically, these weights can be determined through methods such as pairwise comparisons by introducing a hierarchy of criteria to calculate the decision makers' weight vector (Saaty, 1994). However, it can be challenging to find someone with the necessary knowledge to accurately assess the relative importance of each decision maker. Furthermore, the decision makers themselves may not be familiar with one another (Dong & Cooper, 2016). An approach to determining the weights of decision-makers typically involves identifying an appropriate weight vector capable of aggregating individual judgments into a representative group judgment.

By employing a group AHP approach, the method captures the collective judgment of the expert panel, leading to consensus-driven criteria weights (Ozyurek & Erdal, 2018). More precisely, this approach is suitable for public procurement contexts, as it leverages multiple experts' insights to produce a robust weighting of criteria. The group AHP procedure in this study involved the following steps:

The first step is to establish hierarchy. The decision hierarchy with the overall goal at the top and the six evaluation criteria at the next level. In this case, no specific alternatives were included in the hierarchy, since the objective was solely to establish the relative importance of the criteria. Specifically, the focus is on criteria weighting rather than ranking alternatives. This is a necessary step since the AHP framework requires a clear hierarchy and this structure was used to frame the procurement decision problem (Khan et al., 2022).

The second step is pairwise comparisons where each of experts independently performed pairwise comparisons of the six criteria to express their relative importance. Saaty's fundamental scale (Table 1) was used for these comparisons, where a score of 1 indicates that two criteria are equally important, and 9 indicates that one criterion is "extremely more important" than the other, with intermediate values for gradations in between).

The third step is individual priority weight calculation where for each decision-maker's comparison matrix expert's priority weight vector was computed. This vector provides the relative weights of the six criteria for each expert.

In the fourth step consistency of individual weights was verified. After obtaining the weight vector for each expert, the consistency of the expert's pairwise judgments were assessed. AHP provides a consistency check to ensure that the comparisons made by a decision-maker are logically coherent. The Consistency Index (CI) and Consistency Ratio (CR) for each matrix were calculated. The Consistency Index is defined as:

$$CI = \frac{\lambda_{max} - 1}{n - 1}$$

where n is the size of the matrix. The Consistency Ratio is given by:

$$CR = \frac{CI}{RI}$$

where RI is the average random index (a known constant for each size sample). The common rule-of-thumb threshold of CR < 0.10 to judge acceptable consistency (Apostolou & Hassell, 1993). If an expert's comparisons yielded CR higher than 0.10, it would indicate inconsistent judgments, in which case the expert would be asked to revisit and revise those comparisons. In our study, all six experts' matrices

satisfied consistency requirements, confirming that their pairwise evaluations were reasonably consistent.

In the fifth step aggregation of judgments was performed into a single group decision matrix. The Aggregation of Individual Judgments approach using the geometric mean, as recommended by AHP literature for combining multiple decision-makers' inputs (Ossadnik et al., 2016). In this approach, all experts are considered equally important, meaning that each expert's opinion is given equal weight in the aggregation (Zadnik-Stirn & Grošelj, 2010). For every pair of criteria, the group's pairwise comparison value was computed as the geometric mean (Ishizaka & Labib, 2011):

$$a_{ij}^{g} = \sqrt[m]{\prod_{k=1}^{m} a_{ij}^{(k)}}$$

Where a_{ij}^{g} represents group judgement, $a_{ij}^{(k)}$ is the individual judgement of k^{th} expert, and m is the number of experts. The geometric mean aggregation has the important advantage of preserving the reciprocal property of pairwise comparisons (Ossadnik et al., 2016). Furthermore, this method is preferable to a simple arithmetic average of the comparison values because an arithmetic mean can violate the reciprocity and ratio-scale consistency in AHP (Ishizaka & Labib, 2011).

In the sixth step the group criteria weights are obtained by calculating the priority weights of the criteria from the aggregated group matrix. This was done in the same manner as for the individual matrices. These group AHP weights form the basis for the procurement evaluation, reflecting the combined expertise of the decision-makers.

4. Data and model development

The residential care institutions chosen for this analysis were strategically selected based on their critical role in Serbia's social welfare system. These institutions exemplify typical procurement complexities within Serbian public sector settings, involving substantial financial resources and direct impact on socially vulnerable populations. Furthermore, these institutions are subject to rigorous regulatory scrutiny and accountability requirements, making them ideal candidates for examining the effectiveness of scientifically grounded procurement practices (Bergman et al., 2012). The panel of experts involved in this study comprised five senior procurement officers from residential care institutions in Serbia, each with a minimum of five years of experience in public procurement. This composition

ensures that evaluations integrate practical procurement experience thus reflecting a balanced assessment of criteria.

The primary goal of this analysis was to assign weight coefficients to the criteria essential for evaluating bids in the procurement process. To achieve this, Group AHP, a widely recognized subjective method for determining the preferences of decision-makers was applied.

In many decision-making scenarios, the outcome impacts multiple stakeholders, making it essential to adapt the standard AHP for group decision-making. By consulting several experts, the potential biases that may arise from relying on the judgments of a single individual can be minimized, leading to more balanced and representative decisions.

In public procurement procedures, the selection and weighting of evaluation criteria play a critical role in achieving value for money, promoting competition, and ensuring transparency. In this study, five key criteria were considered for the evaluation: offered price, environmental criteria, bid validity period, delivery time, and payment deadline. These criteria were selected based on their relevance and impact on the procurement decisions within the context of residential care institutions. The criterion of price is fundamental, as it directly influences public spending efficiency. However, relying solely on the lowest price may compromise quality and sustainability, which is why modern procurement practices often apply the Most Economically Advantageous Tender principle, balancing price with qualitative aspects. Environmental criteria have gained increasing relevance as contracting authorities seek to support sustainability goals. Precisely, the rising environmental concerns about the EU's activities and policies have made green considerations an increasingly important part of public procurement (Palmujoki et al., 2010). These criteria enable the promotion of goods and services that reduce environmental impact, aligning public procurement with broader policy objectives such as the European Green Deal. Nevertheless, the European Court of Justice has determined that environmental criteria, such as emissions and noise, must be explicitly defined and quantifiable. As a result, vague or non-measurable environmental requirements are not required to be taken into account (Fuentes-Bargues et al., 2017). The bid validity period ensures that submitted offers remain binding long enough to allow for proper evaluation and decision-making. While longer validity periods provide more time to contracting authorities, they may introduce risk and reduce bidder interest if unreasonably extended. Delivery time is a key operational criterion, particularly for procurements where timely implementation is essential, such as in healthcare, infrastructure, or emergency services. It ensures that the selected supplier can meet logistical and scheduling requirements, minimizing disruptions. The warranty period serves as a proxy for the expected quality and reliability of the goods or services offered. A longer warranty period may indicate supplier confidence and can reduce maintenance costs for the contracting authority over time. Lastly, the payment deadline affects

supplier liquidity and financial planning. While typically subject to national and EU regulations to prevent late payments, shorter payment periods can enhance the attractiveness of a tender, especially for small and medium-sized enterprises. Collectively, these criteria provide a comprehensive framework for evaluating bids, balancing financial prudence with quality, risk mitigation, and strategic policy implementation.

5. Results and discussion

The results provide insightful evidence concerning the relative importance of public procurement criteria for residential care institutions (Table 2).

Table 2. Calculated criteria weights

Criteria	Weights
Price	0.3079
Environmental criteria	0.1983
Bid validity period	0.1336
Delivery time	0.0953
Warranty period	0.1324
Payment deadline	0.1324

The criterion with the highest weight is price (0.3079), reinforcing that economic considerations remain the predominant factor influencing procurement decisions in this sector. This outcome aligns with previous research indicating that public procurement systems tend to prioritize cost-efficiency due to budget constraints and fiscal accountability (Ambe, 2019; Marcarelli & Nappi, 2019). The significant weight assigned to environmental criteria (0.1983) highlights a clear shift toward sustainability in public procurement practices. Given recent regulatory emphasis by both the European Union and Serbian procurement frameworks on environmental sustainability (Fuentes-Bargues et al., 2017), this finding suggests an increasing institutional awareness of ecological impacts and policy-driven commitments to environmental goals. It also reflects contemporary trends in public procurement that integrate broader social and environmental objectives alongside traditional economic criteria (Palmujoki et al., 2010). The criteria bid validity period (0.1337), warranty period (0.1324), and payment deadline (0.1324) were assigned moderately balanced weights. These similar weights reflect that while these factors do not dominate the decision-making process individually, their collective impact ensures contractual security, quality assurance, and manageable financial terms for suppliers. The relatively equal prioritization of these three criteria aligns with the principles of fairness, contractual stability, and supplier

engagement emphasized by procurement scholars (Dotoli et al., 2020; Klingler, 2020). Interestingly, the lowest weight was assigned to delivery time (0.0953), suggesting that in the context of residential care procurement, logistical urgency or immediate operational timelines might be comparatively less influential. This could reflect procurement planning maturity, indicating sufficient lead time for operational needs or prioritization of other factors such as long-term value and sustainability over short-term logistical convenience. Nevertheless, this result warrants further exploration, as delays in delivery could critically affect service quality in sensitive contexts such as healthcare and residential care (Pejin Stokić & Bajec, 2018).

Moreover, the low Consistency Ratio (0.0060) demonstrates excellent internal consistency across expert judgments, ensuring reliability and robustness of the obtained criteria weights. This strong consistency underscores the methodological rigor of the applied group AHP procedure and validates its effectiveness in mitigating subjective biases and potential manipulation risks, thereby supporting fairer and more transparent procurement practices (Saaty & Vargas, 2013).

The derived weight coefficients provide explicit insights into procurement decision-making, defining the relative importance assigned by stakeholders to each criterion. Scientifically derived weights significantly reduce arbitrariness in procurement decisions, diminishing opportunities for corruption or biased selections by limiting the subjective influence of any individual evaluator (Marcarelli & Nappi, 2019). Transparent, scientifically-grounded weights promote fairness, accountability, and trust, crucial for public procurement's integrity, especially in environments with historical transparency challenges like Serbia (Corruption Perceptions Index, 2024).

6. Conclusion

This study underscores the critical importance of scientifically structured methodologies, specifically the group AHP, for determining criteria weights within the public procurement context of residential care institutions in Serbia. Given the substantial economic and social implications associated with supplier selection, it is imperative that procurement decisions reflect a balanced and transparent consideration of both quantitative and qualitative factors. The results clearly illustrate that price remains the primary criterion, reflecting the persistent emphasis on cost-efficiency in public procurement practices. However, the significant weighting given to environmental criteria signals a meaningful shift towards sustainability and alignment with broader policy objectives such as those outlined in European and Serbian legislative frameworks.

Moderate and relatively balanced weights assigned to criteria such as bid validity period, warranty period, and payment deadline emphasize the recognition

of contractual clarity and fairness as critical factors in procurement processes. Interestingly, delivery time was attributed the lowest weight, suggesting a procurement strategy characterized by advanced planning and a longer-term perspective rather than immediate operational urgency.

Importantly, the high consistency in expert judgments confirms that the group AHP method provides a robust, transparent, and scientifically defensible approach, significantly reducing opportunities for bias and corruption within procurement procedures. By leveraging collective expert knowledge, the process generates credible and balanced weight assignments, essential for securing the optimal allocation of public resources.

The findings from this research carry important implications for policymakers and procurement officials. Firstly, integrating group AHP into procurement guidelines and regulatory frameworks could substantially enhance transparency and fairness, thereby fostering public trust. Secondly, establishing targeted training programs for procurement officers focusing on scientifically-based multi-criteria methodologies could further institutionalize best practices and ensure sustainable, value-oriented procurement decisions.

Nonetheless, this study acknowledges the inherent cognitive complexity of the AHP approach, particularly when applied in group contexts with numerous pairwise comparisons. Future research directions should consider hybrid methods combining AHP with less cognitively demanding techniques, such as SWARA, to streamline decision-making and minimize cognitive fatigue. Additionally, exploring alternative aggregation mechanisms, including fuzzy logic approaches, could further refine the decision-making process by addressing uncertainties inherent in subjective judgments.

Nevertheless, adopting scientifically-based weighting approaches in public procurement not only enhances decision-making rigor and transparency but also directly supports the achievement of broader sustainability and social objectives, thus profoundly contributing to both economic efficiency and societal wellbeing in the critical sector of residential care.

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IZBOR DOBAVLJAČA U USTANOVAMA SOCIJALNE ZAŠTITE SA SMEŠTAJEM

Apstrakt: Izbor dobavljača u okviru javnih nabavki ima značajan uticaj na ekonomsku efikasnost i društvenu dobrobit, posebno u ustanovama socijalne zaštite sa smeštajem koje su odgovorne za brigu o osetljivim kategorijama stanovništva. Uprkos strateškom značaju nabavnih odluka, ograničen broj istraživanja bavi se određivanjem težinskih koeficijenata kriterijuma u specifičnom kontekstu ustanova sa smeštajem. Ova studija popunjava taj istraživački jaz primenom grupnog Analitičkog hijerarhijskog procesa (group AHP) radi određivanja težina odabranih nabavnih kriterijuma u ustanovama socijalne zaštite u Srbiji. Rezultati pokazuju da cena ostaje dominantan faktor, iako održivost sve više dobija na značaju, čime se prakse javnih nabavki usklađuju sa širim regulatornim i strateškim ciljevima. Umereno ponderisani kriterijumi ukazuju na važnost jasnoće i pravičnosti ugovornih uslova, dok se vreme isporuke pokazuje kao kriterijum nižeg prioriteta. Primena grupnog AHP-a pokazuje visok stepen konzistentnosti među ocenama eksperata, što potvrđuje njegovu efikasnost u unapređenju transparentnosti i smanjenju potencijalnih pristrasnosti ili korupcije. Nalazi ukazuju na potrebu za uvođenjem naučno utemeljenih višekriterijumskih pristupa u okvire javnih nabavki, kao i na značaj obuke stručnjaka za nabavke u cilju donošenja informisanih, održivih i društveno odgovornih odluka.

Ključne reči: javne nabavke, ustanove socijalne zaštite sa smeštajem, izbor dobavljača, određivanje težinskih koeficijenata, grupni analitički hijerarhijski proces, višekriterijumsko odlučivanje

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