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ECONOMIC DIPLOMACY: NEGOTIATION CONTEXT AND COMMERCIAL ASPECT - ENCOURAGING EXPORT AND INVESTMENT

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Abstract: *The need to find negotiated solutions to global challenges has further affirmed the priority role of economic and commercial diplomacy. Accordingly, both economic and commercial diplomacy have drawn the interest of researchers in various fields, including international economics, business and finance, as well as international marketing and management. This is particularly significant as encouraging exports and investments through economic/commercial diplomacy activities can contribute to a country's favorable positioning in the international/global market. There is a debate in the relevant literature regarding whether encouraging exports and investments falls within the domain of economic or commercial diplomacy, and whether the two concepts can be considered equivalent. Therefore, some approaches to observing economic and commercial diplomacy are presented in the paper. Since negotiation is the core of diplomacy, economic and commercial diplomacy in the negotiation context is also presented, with a particular emphasis on encouraging exports and investments. The aim of the paper was to further affirm the concept of economic/commercial diplomacy, given that its application can contribute to the favorable positioning of the country and its companies in the areas of exports and investments. For this purpose, an analysis of recent relevant literature was conducted, on the basis of which the authors concluded that the effects of diplomatic activities, both in general and in the field of exports and investments, are more important than the question of which branch of diplomacy encompasses these activities. In addition, economic and commercial diplomacy should complement each other in practice instead of functioning independently, even though researchers conceptually differentiate between them. Finally, negotiation takes on the character of diplomatic-business negotiation incorporating the elements of diplomatic and commercial negotiation. The findings may be useful to policymakers and other actors involved in economic and commercial diplomacy.*

Keywords: *economic diplomacy, commercial diplomacy, negotiations, export, investment, international/global market*

INTRODUCTION

Economic diplomacy is an approach to decision-making in international relations and international business [1]. It focuses on international economic issues and incorporates the domestic process as a fundamental element [2]. Economic diplomacy contributes to improving economic opportunities for a country and its companies in the international business, while also reducing external barriers and mitigating potential threats from the international environment. It leads to strengthening of economic security [3] and increasing national competitiveness [4]. Therefore, economic diplomacy activities become a challenge for researchers and practitioners in the field of international economics, finance and business, international marketing and management.

The growing need to negotiate solutions to global challenges and advance domestic policy objectives has made economic diplomacy more important than ever before [1]; [2]; [5]. As nations face increasing economic interdependence on a global scale, they need to adopt strategic approaches to promote national interests, particularly those in international trade and investment [6]. One such approach is based on economic/commercial diplomacy.

Since there is disagreement among researchers in the relevant literature on whether encouraging exports and investments falls within the domain of economic or commercial diplomacy, and whether commercial diplomacy is part of economic diplomacy or not [2]; [5]; [7]; [8], this paper briefly presents some approaches to observing economic and commercial diplomacy. In addition, since negotiation constitutes the essence of all forms of diplomacy [2]; [5]; [9], this paper examines economic and commercial diplomacy within the context of negotiations, with particular emphasis on commercial diplomacy as a means of promoting exports and attracting investment. This is especially important as the promotion of exports and investment has never been more crucial-especially for less developed countries [6]; [10]; [11].

The aim of the paper is to further affirm the concept of economic/commercial diplomacy, since its application in practice can contribute to the favorable positioning of the country and its companies in exports and investments. An analysis of recent relevant literature was conducted using keywords such as economic diplomacy, commercial diplomacy, negotiation, export and investment promotion, as well as their combinations (Google Scholar database, after 2010). The authors of this paper conclude that the effects of diplomatic activities in general, and in the field of exports and investments, are more important than the specific branch of diplomacy under which these activities are categorized. In addition, it is important that economic and commercial diplomacy complement each other in practice, rather than exclude each other, even when researchers distinguish between them. Finally, the negotiation takes the form of diplomatic-business negotiation, incorporating elements of both diplomatic and commercial negotiation. Business negotiation and communication strategies become increasingly important when addressing commercial issues.

The paper aims to encourage policymakers to adopt a systematic approach to developing commercial diplomacy within the broader economic diplomacy framework. It also seeks to raise awareness among all stakeholders in economic and commercial diplomacy-particularly those from the public and business sectors-about the importance of effective cooperation. Mastering the techniques of diplomatic and commercial negotiation is essential in order to effectively encourage exports and investments.

1. ECONOMIC DIPLOMACY: ACHIEVING ECONOMIC EFFECTS THROUGH NEGOTIATION

According to Henry Kissinger (1957) in [12] diplomacy is a negotiation process in a legitimate context. Jönsson and Aggestam [13] state that diplomacy focuses on the international relations management through negotiation**.** Thus, “Negotiations are the basic means to pursue, prevent, manage, resolve, and transform conflicts among states (and other parties), including conflicts on how to overcome problems and install cooperation" [14, p. 210]. It can be concluded that negotiations are the primary instrument of other forms of diplomacy, including economic and commercial diplomacy.

Economic diplomacy is observed as the approach to decision-making in international relations and business [1]. Since the term "economic diplomacy" is derived from the words economy and diplomacy, it emphasizes economic effects. This term can be found in French ("la diplomatie economique") and Russian ("economic diplomaty") terminology. However, in American terminology, the term "international business" or "trade diplomacy", and the term "commercial diplomacy" are used for economic diplomacy. Finally, according to Bayne and Woolcock [2, p. 4] "economic diplomacy is best defined not by its instruments, but by the economic issues that provide its content". Firstly, economic diplomacy is focused on international economic issues. Secondly, economic diplomacy extends far beyond foreign ministries and any single state actor. It includes non-state actors such as non-governmental organizations, business entities etc. Thirdly, economic diplomacy uses the whole spectrum of measures such as informal negotiations and voluntary cooperation, soft forms of regulation (e.g. codes of conduct), and binding rules [*Ibid*]. As stated by Sano and Rassias [6], it includes multilateral and bilateral trade negotiations, the role of international institutions/organizations in supporting economic goals, and public-private partnerships. Thus, economic diplomacy is the negotiation process on mainstream economic topics [1]. Therefore, similar to diplomacy, economic diplomacy is carried out primarily through negotiations, alongside various other tools and measures.

2. ECONOMIC AND COMMERCIAL DIPLOMACY

From a broader perspective, Okano–Heijmans [7] emphasizes that economic diplomacy requires considering economic (commercial) and political interests together. In this sense, economic diplomacy includes several strands with a more economic or more political purpose, and it is like an umbrella. In support of this is Islam and Hossen's [15] claim that the economic diplomacy development as an important instrument of bilateral relations has led to the intertwining of economic and political interests and their goals. At the same time, a narrow definition of economic diplomacy suggests that it focuses specifically on matters of international economic policy [5, p. 210], that is, on international economic issues [2]. It is clear that economic diplomacy, whether viewed broadly or narrowly, deals with issues that have economic effects at the national or international levels.

Economic diplomacy includes *commercial diplomacy* (generic, sector and company-specific trade and investment promotion), *trade diplomacy* (negotiations between two or more parties/countries that support trade and/or investment agreements and economic transactions), and more politically motivated *attempts to influence others*. Commercial diplomacy has the most developed literature body among these economic diplomacy branches [7]. However, the relevant literature on the instruments/means of conducting commercial diplomacy indicates the need for their further clarification and conceptualization [10]. Also, there is a relative lack of literature on commercial diplomacy that focuses on the business and management aspects [16].

Some researchers point out that commercial diplomacy is part of economic diplomacy. Others believe that they are distinct but strongly related. Thus, the definitions of economic and commercial diplomacy in the relevant literature vary significantly, while in practice there is no significant difference between them.

Reuvers and Ruël (2012) in [17, p. 108] state that *economic diplomacy* uses diplomatic means to achieve economic and foreign policy goals. "*Commercial diplomacy* is the use of diplomatic means to support commercial activities, such as export and foreign direct investment (FDI) promotion". Commercial diplomacy includes nation branding as well as participation in multilateral meetings. It is part of economic diplomacy. Okano – Heijmans [7] states that economic diplomacy is often equated with commercial diplomacy, especially by authors who have a dominantly economic take on this subject. Namely, commercial diplomacy is one of the economic diplomacy strands. In line with that, Okano – Heijmans [*Ibid*] further states that promoting trade and investment at the general and business level (via business advocacy) is the task of all governments and is carried out by them in some way. According to Jones-Bos *et al*. (2012) in [*Ibid*] the activities such as providing intelligence, offering concrete hands-on assistance (including trade questions and market access issues, trade missions etc.), providing partners search and networking support "can be performed by specialised trade and investment support offices at home and/or by embassies or other representations abroad"[*Ibid*, p. 556]. A greater presence of the private sector in a particular country (internationalization of the business sector strengthens its connections with the public sector, which in turn encourages greater private sector investment in commercial diplomacy with that foreign country. According to Rana [8] it is possible to see commercial diplomacy as a subset of economic diplomacy. Economic (diplomacy) is a much wider term than commercial (diplomacy). Economic diplomacy includes the following: the World Bank, IMF, UNCTAD; aid, technology transfer, S&T agreements; country brand, and tourism promotion [*Ibid*, p. 107]. Commercial diplomacy includes trade promotion; networking with business; FTAs, RTAs and other trade agreements; WTO multilateral trade issues; FDI promotion + investment & other accords; Joint Commissions, business councils, EP groups [*Ibid*].

Some researchers believe that commercial diplomacy is distinct from economic diplomacy. They state that public sector is the actor of commercial diplomacy. Kostecki and Naray (2007, p.1) in [17, p. 109] note that *commercial diplomacy* is "a government service to the business community, which aims at the development of socially beneficial international business ventures". Berridge and James (2003) in [*Ibid*] state that *commercial diplomacy* includes the promotion of investment (inward and outward investment) as well as trade. Naray (2008, p. 2) in [*Ibid*] says commercial diplomacy as "an activity conducted by public actors with diplomatic status in view of business promotion between a home and a host country. It aims at encouraging business development through a series of business pro-motion and facilitation activities". Lee (2004, p. 51) in [*Ibid*] points out that public and private actors provide the services of commercial diplomacy. Thus, commercial diplomacy is "the work of a network of public and private actors who manage commercial relations using diplomatic channels and processes". According to Beridge [5, p. 210] *commercial diplomacy* generally encompasses assistance in promoting exports and foreign direct investment as well as access to raw materials, while "*economic diplomacy*, narrowly defined, is concerned with international economic policy questions..." Van Bergeik (2009) in [2, p. 4.] states that export and investment promotion is the principal function of *economic diplomacy* while Bayne and Woolcock [*Ibid*] state that export and investment promotion is the principal function of *commercial diplomacy*. Chatterjee [18] confirms that while there is a distinction between economic diplomacy and commercial diplomacy, it is also important to maintain a balance between the two.

Yatsenko, Iatsenko, and Khmara [19] examine commercial diplomacy from both the macro and micro levels. Commercial diplomacy at the macro level is mainly focused on negotiating the rules and principles that define, regulate and guide international trade flows and investments at the national level, regardless of individual organizations, companies, projects or transactions. Among the main tools of commercial diplomacy at this level are communication and negotiations. Commercial diplomacy on the micro level provides assistance to individual organizations and companies in areas such as foreign trade, attracting investment, strengthening competition, etc. Therefore, the promotion of national economic interests in foreign markets, the domestic market protection, and promoting interests of companies in international trade is carried out by means of commercial diplomacy. In line with the above, commercial diplomacy is a tool for promoting a country's national business opportunities and the business opportunities of its companies.

Indira Nooyi, the CEO of Pepsico, stated that "Commercial diplomacy entails talking to private enterprise" [8, p. 106]. Nooyi compared diplomats with 'investor relations executives' who visit investors, listen to their issues, and relay their concerns back to the corporate headquarters" [*Ibid*]. Some authors (such as Saner and Yiu), consider that the activities of commercial diplomacy carried out by the private sector are actually part of corporate or business diplomacy [17]. Although this is quite clear, the cooperation between state actors and business actors encourages the convergence of commercial and business diplomacy. In line with that, the connections between commerce (commercial diplomacy), trade (trade diplomacy), and development (development cooperation) are significantly stronger today than they were in the 1990s. [7]. Moreover, over the past decade, greater priority has been placed on economic and commercial diplomacy. Finally, it is clear that all forms of economic diplomacy are interconnected and mutually reinforcing rather than mutually exclusive.

The relevant literature indicates that commercial diplomats are increasingly engaged in promoting the national brand and image of companies, attracting investment, expanding tourism, etc. Therefore, this paper adopts the views of Bayne and Woolcock, who state that promoting exports and foreign direct investment is the main function of commercial diplomacy. In this area, commercial diplomacy combines the functions and interests of the country/government and the business sector [20].

Based on the above, in modern conditions, economic and commercial diplomacy activities are also undertaken by non-state actors, including representatives from the business sector. In modern conditions, both economic and commercial diplomacy activities are also carried out by actors from the non-state sector, including actors from the business sector.

New information technologies allow them easier access to foreign markets [21]. The Serbian model of economic diplomacy is undergoing a reform with the aim of improving relations between the government and the business sector and increasing their effects in promoting trade and investment on the one hand, and eliminating duplication of tasks on the other. It is advisable to view economic/commercial diplomacy activities carried out by business sector actors (e.g. companies) from a (international) marketing perspective. Since marketing involves research aimed at selecting a target market, determining an appropriate marketing strategy, and positioning within that market, its role is to provide guidance in these decision-making processes.

3. INTERNATIONAL NEGOTIATION AND COMMERCIAL DIPLOMACY

From a diplomatic perspective, "negotiation can be defined as an attempt to explore and reconcile conflicting positions in order to reach an acceptable outcome" [22, p. 52]. According to Barston [9], Iklé explicitly defines negotiation. In fact, Iklé emphasizes that negotiation is an exchange of proposals. "It is the confrontation of explicit proposals that distinguishes negotiation from tacit bargaining and other forms of conflict behavior" [22, p. 52]. The above applies to diplomatic negotiations in particular.

Contemporary diplomatic negotiation is characterized by the rise of "unconventional" forms of agreements as well as multi-party agreements, etc. [23]. According to Woolcock [24], there are various levels on which international negotiations take place. "The choice between the multilateral and the preferential level of negotiations, which is central to the debate on trade, is the best known, but by no means the only case of multi-level economic diplomacy" [*Ibid*, p. 316]. Multilateral trade negotiations (MTN) *have global significance*. MTN are a highly complex and lengthy processes. The topics they deal with are diverse, the number of participating countries exceeds 160, and their duration can be up to several years [25]. Central aspects of MTN are "the decision-making methods, the modes of negotiations and the issues of leadership and trust among participants" [*Ibid*, p. 186]. MTNs are not the subject of this paper. Bilateral trade negotiations involve two parties/two countries which negotiate about trade issues. Kone [26] concludes that the importance of international trade negotiations is increasing. These negotiations, which take place in bilateral, multilateral or regional forums, are increasingly difficult to conclude. First, these are negotiations that involve countries or groups of countries, so they are complex and differ from other types of negotiations in general. In addition, there are specific characteristics of these negotiations that set them apart from other types of trade negotiations. Kone [26] links international commercial and diplomatic negotiation.

International investment negotiations (IINs) are unique. They bring together a wide range of actors (parties) with largely opposing views on problems or issues that are strongly linked to other (economic) issues. The volatile nature of investment negotiations is influenced by the fact that the needs and/or interests of the same group of actors can be pursued on multiple levels and venues (that are partially overlapping). These characteristics highlight the importance of the negotiation process [27].

Commercial diplomacy focuses on the negotiation of commercial deals. It involves multiple public and private actors. They negotiate a business deal with public and private commercial interests. Huge commercial deals rely on government commercial intelligence ("information gathering"), support ("lobby for"), and promote ("advocacy") of business in formal and informal negotiations that take place in a variety of settings [20]. Hajdukiewicz [17] cites Mercier's view that commercial diplomacy, observed as part of economic diplomacy, is concerned with the negotiations of trade agreements/contracts and their implementation. On the micro level, commercial diplomacy is more concerned with trade and investment support [2]; [19]. In this sense, negotiations encourage the growth of the country's exports and investments.

4. ENCOURAGING EXPORTS AND INVESTMENTS

Some empirical studies have confirmed the positive effects of the economic diplomacy instruments on bilateral trade flows, especially on a country's exports [11]. Given that it focuses on trade and investment [2]; [19], commercial diplomacy also contributes to their enhancement. These commercial diplomacy activities are carried out through embassies, via export promotion agencies or directly by the business sector.

According to Berridge [28], embassies represent (advocate), negotiate and lobby, conduct political reporting, gather information, foster the country's interests and local friendly relations, and conduct commercial diplomatic activities in the host country. Export promotion agencies help exporting companies find and select target markets for their products and services [11]. Therefore, government and its institutions play a key role in reducing the uncertainty of international trade and investment and in helping companies establish trade and investment relationships. In [*Ibid*], it is noted that economic/commercial diplomats identify sales and investment opportunities for companies and provide them with market and consumer information. They also support the search for partners, the negotiation process, and the contracting process between partners.

Finally, a country's diplomatic network, along with its economic and commercial diplomacy, provides direct access for both the nation and its companies to new opportunities in host countries. Accordingly, access to foreign markets for international companies is supported by a foreign mission with a commercial presence in the host country [20]. However, the support provided by commercial diplomats to companies seeking to enter new international markets is declining, as such information has become more readily accessible to the companies themselves. The Internet and transparency in business by various organizations (e.g. WTO or EU) make this possible [21]. Strategic cooperation and synergistic action of all sectors as actors of commercial diplomacy are needed to encourage exports and investments. However, strategic cooperation and synergistic action of all sectors as actors of commercial diplomacy are necessary for the purpose of encouraging exports and investments and overall national development.

5. EXPORTS AND INVESTMENTS IN THE NEGOTIATION CONTEXT

"Diplomatic negotiation employs specific forms of interaction, using a distinct language, protocol norms, symbols, ceremonies, and rituals" [23 p. 275]. Interaction between parties at all levels (national, organizational and individual) makes diplomatic negotiations more successful [*Ibid*]. In economic-diplomatic negotiations, it is desirable to treat the other negotiating party or parties as collaborators. Namely, according to Chatterjee [18], the parties in economic diplomacy-based negotiations should ideally be treated as partners instead of contracting parties.

The literature shows that negotiation strategy can influence the outcome of negotiations (e.g., better price, product, or best agreement terms) [29]. In this sense, some research has confirmed that cooperation is the best strategy both pre- and post- negotiations in the export industry, while avoidance is the worst strategy [30]. Cooperation is generally the optimal negotiation strategy. It leads to the development of long-term good relations between the negotiating parties. It is the basis of principled negotiation. Principled negotiation advocates benefits for both parties (win-win).

Effective communication is one of the key elements of successful negotiations. According to Wang [31], this is especially true for investment negotiations. Establishing and developing trust and cooperation between the parties in investment negotiations relies on a well-chosen communication strategy and communication techniques such as active listening, adapting to the audience due to the variety of the negotiating parties, transparency and clarity, and cultural sensitivity [*Ibid*]. Investment decisions are generally risky, so the negotiation process itself requires special caution.

Specialized training in acquiring skills in effective negotiation and communication, developing cooperation, conflict resolution and strategic decision-making contribute to the growth of economic/commercial performance on both company and country level, and their favorable positioning in the international environment. As economies become increasingly interconnected, it is necessary to understand the importance and thus the effects of professional training in trade and negotiation, which especially applies to policymakers [32]. In contemporary conditions, digitization is changing the nature of diplomacy and international negotiations. It offers new opportunities in terms of new negotiation tactics, formats, tools and techniques. It also requires economic and trade diplomats to ensure information security and maintain confidentiality. They are expected to possess new knowledge, skills and competencies in the field of data management. In line with that, Cherkasov and Makliuk [33] highlight the necessity and importance of adapting classical negotiation models to modern conditions and contemporary realities such as new technologies, globalization, geopolitical changes, etc.

Finally, the question arises as to whether negotiation in commercial diplomacy is primarily diplomatic or primarily commercial. This depends on the subject of negotiation, its level, participants and goal. When state actors of economic/commercial diplomacy negotiate, the negotiations have a more diplomatic character. In the case when the actors of economic/commercial diplomacy are from the business sector (non-state actors), then the negotiation has elements of commercial negotiation. This is particularly evident in negotiations about a specific export deal or investments between two countries or their companies that are supported by the state.

6. CONCLUSION

The trend of global economic interdependence of nations dictates the adoption of strategic approaches to the promotion of national interests, including those related to the promotion international trade and investments. Modern economic diplomacy, as a strategic approach to protecting and promoting national interests, goes beyond traditional methods of bilateral trade negotiations and government support through foreign economic policy. It is intensifying in the areas of export promotion, investment attraction, and trade agreement negotiation, etc. Since export and investment promotion can contribute to the favorable international market positioning of a country and its companies, many countries encourage exports and investments through the economic/commercial diplomacy activities. There is disagreement among researchers in the relevant literature on whether encouraging export and investment falls within the domain of economic or commercial diplomacy, and whether commercial diplomacy is a part of economic diplomacy or not. Therefore, this paper outlined approaches for examining economic and commercial diplomacy. In addition, since negotiation is the essence of diplomacy, the paper presented economic and commercial diplomacy in the negotiation context with a focus on encouraging exports and investments.

The aim of the paper was to further affirm the concept of economic/commercial diplomacy, since its application in practice can contribute to the favorable positioning of a country and its companies in exports and investments. For this purpose, an analysis of recent relevant literature was conducted (Google Scholar database, after 2010). The authors of this paper concluded that the impact of diplomatic activities, particularly in the areas of exports and investments, is more significant than the specific branch of diplomacy under which these activities fall. In addition, it is important that economic and commercial diplomacy complement each other in practice, rather than exclude each other, even when researchers distinguish between them. What is not in question is that all forms of economic diplomacy should be interconnected. Finally, encouraging exports and investments in the joint action of the state and business sectors is more in the domain of commercial than economic diplomacy. In addition, negotiation takes on the character of diplomatic-business negotiation with the elements of diplomatic and commercial negotiation. Business negotiation and communication strategies are becoming increasingly important in the context of commercial negotiations.

This paper serves as a recommendation for government policy in support of export strategy through strengthening of the commercial diplomacy instruments. The paper is expected to encourage policymakers to systematically approach the development of commercial diplomacy in the economic diplomacy system. It is also expected to contribute to the growth of awareness of all actors of commercial diplomacy about the necessary cooperation, especially those from the state and business sectors. Mastering the techniques of diplomatic and commercial negotiation based on information technologies is essential in order to effectively promote exports and investments.

In today's context, trade barriers are declining while competition in exports and investment is intensifying, making it essential for countries to adopt a range of strategies (diplomatic strategy, economic and commercial diplomacy strategy, etc.) to protect economic interests and international position, and take advantage of global opportunities. For Serbia, the integration of economic diplomacy tools into its foreign policy remains a challenge, as does the integration of commercial diplomacy tools into economic diplomacy. These are also guidelines for further research in this area.

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ЕКОНОМСКА ДИПЛОМАТИЈА: ПРЕГОВАРАЧКИ КОНТЕКСТ И КОМЕРЦИЈАЛНИ АСПЕКТ – ПОДСТИЦАЊЕ ИЗВОЗА И ИНВЕСТИЦИЈА

Резиме: *Потреба за проналажењем преговарачких решења за глобалне изазове додатно је афирмисала приоритетну улогу економске и комерцијалне дипломатије. Сходно томе, и економска и комерцијална дипломатија су привукле пажњу истраживача у различитим областима, укључујући међународну економију, бизнис и финансије, те међународни маркетинг и менаџмент. Ово је посебно важно будући да унапређење извоза и инвестиција путем активности економске/комерцијалне дипломатије може допринети повољном позиционирању земље на међународном/глобалном тржишту. У релевантној литератури води се дебата о томе да ли подстицање извоза и инвестиција спада у домен економске или комерцијалне дипломатије и да ли се та два концепта могу сматрати еквивалентним. Стога су у раду представљени приступи посматрању економске и комерцијалне дипломатије. Будући да је преговарање срж дипломатије, представљена је и економска и комерцијална дипломатија у контексту преговора, с посебним нагласком на подстицање извоза и инвестиција. Циљ рада био је да се додатно афирмише концепт економске/комерцијалне дипломатије, с обзиром на то да њена примена може допринети повољном позиционирању земље и њених компанија у областима извоза и инвестиција. У ту сврху је спроведена анализа новије релевантне литературе, на основу које су аутори закључили да су ефекти дипломатских активности уопштено, и у области извоза и инвестиција, важнији од тога која грана дипломатије обухвата те активности. Осим тога, економска и комерцијална дипломатија би се требале у пракси допуњавати уместо да функционишу самостално, иако их истраживачи концептуално разликују. Коначно, преговарање поприма карактер дипломатско-пословног преговарања које укључује елементе дипломатског и комерцијалног преговарања. Налази могу бити корисни креаторима политика и другим актерима укљученим у економску и комерцијалну дипломатију.*

Кључне речи: *економска дипломатија, комерцијална дипломатија, преговори, извоз, инвестиције, међународно/глобално тржиште*

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DATA-DRIVEN MANAGEMENT AND BUSINESS INTELLIGENCE AS DETERMINANTS OF SUSTAINABLE GROWTH OF ENTERPRISES IN THE REPUBLIC OF SERBIA

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Abstract: *In the context of digital transformation and increasing market uncertainty, data-driven management and business intelligence (BI) systems have become essential instruments for improving strategic decision-making and ensuring sustainable enterprise growth. The subject of this paper is the analysis of the role of data-driven management and business intelligence as determinants of sustainable growth of enterprises in the Republic of Serbia. The aim of the research is to examine the theoretical foundations of these concepts and to assess their significance for competitiveness and long-term business stability in a transitional economy. The research is based on a theoretical-analytical approach, including a review of relevant international and domestic literature, comparative analysis, and the methods of synthesis and deduction. The results indicate that the effective integration of BI tools into managerial processes enhances decision quality, reduces business risk, and strengthens competitive positioning. However, limited digital maturity and insufficient analytical culture remain significant challenges in Serbian enterprises. The paper concludes that systematic implementation of data-driven practices represents a strategic prerequisite for sustainable growth and long-term economic development.*

Keywords: *Data-driven management, business intelligence, sustainable growth, strategic decision-making, digital transformation, competitiveness, Serbian enterprises.*

1. INTRODUCTION

In the modern business environment, characterized by rapid technological changes, digital transformation and increased market uncertainty, companies increasingly rely on analytical approaches to decision-making. Traditional management models, based mainly on experience and intuition, less and less enable the timely recognition of business opportunities and risks, which limits the competitiveness and long-term sustainability of the company [1, p. 23]. In this context, the concept of data-driven management and the implementation of a business intelligence system (Business Intelligence-BI) become key instruments for improving strategic decision-making and achieving sustainable growth of organizations [2, p. 45].

Data-driven management is an approach to management in which decisions are made based on data, and not only on the experience or intuition of the manager. This approach enables organizations to better plan resources, optimize processes and improve business performance. Studies show that organizations that develop a data-driven culture are more likely to successfully implement business intelligence (BI) and analytical tools, which directly affects the quality of managerial decision-making and overall business results [3, p. 649-661].

Business intelligence and analytics enable managers to identify trends, predict market risks and opportunities, and improve organizational efficiency. Business intelligence systems are used to collect, process and analyze large amounts of data, thereby ensuring faster and more accurate decision-making. According to [4], the implementation of BI systems and analytical tools in organizations that foster a data-driven culture lead to a significant increase in the performance of managers and the overall competitiveness of the company. Establishing a data-driven culture in an enterprise is not possible only with technical solutions. Organizations must develop organizational practices that encourage the use of data, including employee training, defining standards for data collection, and clearly defined procedures for data analysis. The lack of this culture often leads to ineffective implementation of BI tools, even when the organization has advanced technological resources [5, p. 936].

The subject of this paper is the analysis of the role of data-driven management and business intelligence as determinants of sustainable growth of companies in the Republic of Serbia. Special attention was paid to the identification of key factors that enable the effective application of BI tools in managerial processes, as well as to the analysis of obstacles faced by Serbian companies, including insufficient digital maturity, limited analytical culture and infrastructural limitations [6, p. 12-15].

The goal of the research is to systematize theoretical knowledge about data-driven management and business intelligence, analyze their implications for competitiveness and long-term stability of companies, and to provide recommendations for improving strategic processes in Serbia [7, p. 78-80]. The research is based on a theoretical-analytical approach, including a review of relevant domestic and international literature, comparative analysis and methods of synthesis and deduction [8, p. 14-18].

The research questions that this paper raises are:

1. What is the role of data-driven management in improving the quality of strategic decision-making?
2. How do business intelligence systems contribute to the sustainable growth and competitiveness of companies in Serbia?
3. What are the main obstacles and challenges of implementing BI practices in the context of Serbian companies?

The results of the work are expected in the form of theoretical systematization of terms, identification of factors for the successful application of BI systems, analysis of limitations in the local business environment and the proposal of a conceptual model of data-driven management adapted to Serbian companies [9, p. 34-36]. This approach allows to contribute to a better understanding of modern managerial practices and their application in the real economy. The application of business intelligence systems and data-driven management in Serbia is still in development, but studies show that companies that adopt these methods record an increase in productivity, better planning and cost optimization. The use of BI tools enables managers in Serbia to react more quickly to market changes and make decisions based on real data, which contributes to the sustainable economic development of companies [4; 3, p. 729-739].

The application of data driven management and business intelligence (BI) systems in the Republic of Serbia is still under development, but concrete examples indicate growing interest and initial results. In larger companies, such as telecommunications operators, the application of BI systems for data integration and analysis allows management to make better strategic decisions based on real data [Ibidem].

In the sector of business services and small and medium-sized enterprises in Serbia, research shows that there is a high recognition of the potential of BI systems and analytics for improving business performance, especially in the areas of cost optimization, planning and resource management [10, para r. 177-186]. However, a significant number of organizations face challenges such as lack of digital maturity, insufficient analytical culture and limited resources to implement complex BI solutions [11, p. 45-55]. Research on digital transformation in the context of companies in the region indicates that BI systems and advanced analytics can contribute to the agility and competitiveness of organizations, but that successful implementation requires management support, continuous employee education and a clear strategic vision [12, p. 90-100]. In Serbia, this trend is slowly developing, and an increasing number of companies are starting to use data visualization and analysis tools to improve decision-making processes and business results [13, p. 46-55]. In addition, in the conditions of digital transformation, the integration of BI systems with other business functions such as finance, marketing and operations, represents an opportunity to improve the competitiveness of domestic companies and strengthen their position on the regional market [14].

Despite these positive trends, the need for standardized models, local empirical studies and theoretical frameworks that integrate global practices with the specificities of the Serbian context remain an important direction for future research [5].

2. LITERATURE REVIEW

For the purposes of this paper, current sources related to business intelligence, data-driven approach and analytics in management were used, with a special focus on the economic development of companies. The literature has been carefully selected according to relevance to research questions, quality and practical application, with the priority being papers that include empirical examples, case studies or the application of BI systems and analytical solutions in organizations. Sources from peer-reviewed journals, recognized publishers and international anthologies were taken into account, in order to ensure the reliability and topicality of the information. The reviewed works show that data-driven management is a key factor for improving strategic decision-making and operational efficiency of organizations [3, p. 729-739]. Studies indicate that the implementation of a BI system allows organizations to integrate data from different sources, analyze trends and optimize resources, which directly affects business performance [10, p. 177-186].

In the context of the Republic of Serbia, the implementation of BI systems is still in development, but examples from large companies, such as Telekom Srbija, show that data integration and information analysis significantly contribute to faster and better decision-making. At the same time, research shows that many organizations in Serbia have challenges such as a lack of analytical culture, limited resources and the need for additional education of employees [12, p. 90-100; 13].

The literature review also shows that the successful implementation of data-driven management requires a combination of technological solutions, a strategic management approach and an organizational culture that encourages the use of data in decision-making [14; 5]. In Serbia, this trend is growing, and an increasing number of companies are starting to use data visualization and analytics tools to improve performance and competitiveness in the market.

Contemporary management concepts increasingly emphasize the importance of customer relations as a key source of competitive advantage. In this context, the concept of customer relationship management (CRM) represents the integration of business strategy, organizational culture and information technologies, with the aim of improving user satisfaction and loyalty, as well as achieving better business performance [15, p. 89-95].

The synthesis of literature enabled the identification of key trends, advantages and challenges of the implementation of BI systems and data-driven approaches in companies in Serbia and provides a theoretical basis for further research and recommendations for implementation in practice.

3. MATERIAL AND METHODS

For the purposes of this paper, the method of theoretical-analytical synthesis was used, based on a systematic analysis of the available literature in the field of business intelligence and data-driven management. Sources from peer-reviewed international journals, collections, books, and relevant reports published in the last ten years were used, in order to ensure the topicality and relevance of the data. Special emphasis is placed on works that investigate the application of business intelligence systems and analytical tools in companies and organizations, including examples from the Republic of Serbia.

Criteria for literature selection included topicality, relevance to the topic, publication quality and practical application in a business environment. The selected works were analyzed descriptively and comparatively, with the aim of identifying key trends, advantages and challenges in the application of data-driven management and business intelligence. The analysis also included the identification of gaps in the literature and potential directions for further research.

Based on the reviewed literature, the work integrates global approaches with the specifics of the Serbian business context, providing a theoretical framework and practical recommendations for improving management in companies. In doing so, the aspect of strategic decision-making, optimization of resources and improvement of competitiveness through the use of analytical tools was specially addressed.

4. RESEARCH RESULTS

Based on the theoretical-analytical analysis of the available literature, it can be concluded that data-driven management and business intelligence systems have a significant impact on the improvement of business and economic development of companies. The obtained results allow answering the research questions.

4.1. What is the role of data-driven management in improving the quality of strategic decision-making?

The first research question related to the role of data-driven management in improving the quality of strategic decision-making. Data-driven management represents a modern approach to management in which decision-making is based on systematic data analysis, instead of exclusively on intuition, experience or subjective assessments of managers. In the context of strategic decision-making, this approach plays a key role because it allows organizations to base their decisions on objective and verifiable information, thereby increasing their accuracy and reliability.

One of the main advantages of a data-driven approach is the reduction of uncertainty in the decision-making process. Traditional strategic decision-making often relied on assumptions and limited information, while data-driven management enables the analysis of large amounts of data (so-called big data), including market trends, consumer behavior, financial indicators and operational performance. In this way, managers get a more comprehensive insight into the business environment and can make more informed decisions [16]. In addition, data-driven management contributes to increasing the accuracy and objectivity of decisions. Data analysis identifies patterns, correlations and trends that are not always visible through traditional management methods. This reduces the impact of cognitive biases and subjective assessments, which leads to more rational and transparent decision-making [17]. An important aspect is the proactive dimension of strategic decision-making. By using predictive analytics and advanced models, organizations can not only analyze past performance, but also predict future trends and scenarios. This allows managers to recognize potential opportunities and threats before they fully manifest, thereby moving from a reactive to a proactive management model [18]. Furthermore, a data-driven approach significantly improves the efficiency of resource allocation. Data analysis enables the identification of inefficiencies in business processes, which gives managers a basis for optimizing costs, improving productivity and better directing investments. Thus, strategic decisions become not only better quality, but also more economical [Ibid,16]. Also, data-driven management enables continuous monitoring and evaluation of the strategy. Unlike traditional approaches, where the effects of decisions are evaluated over time, analytics tools allow monitoring of key performance indicators (KPIs) in real time. This enables rapid strategy corrections and continuous business improvement [Ibid, 17].

However, it is important to emphasize that the quality of strategic decision-making does not only depend on the availability of data, but also on their qualitative processing. Poor data quality, inadequate interpretation or lack of analytical skills can lead to wrong conclusions and decisions. Therefore, the development of an organizational culture based on data and the improvement of analytical competences of employees is a key prerequisite for the successful application of data-driven management [19].

The role of data-driven management in improving strategic decision-making can be clearly seen on the example of large companies in the Republic of Serbia that have implemented advanced analytical systems. For example, Telekom Srbija uses big data analytics for user segmentation and optimization of service offerings. Based on the analysis of user behavior, management makes decisions on the creation of packages and pricing strategies, thereby increasing user satisfaction and reducing the churn rate [1, p. 45-52; 20, p. 1-10; 29; 30].

A similar approach is present in the banking sector, where NLB Komercijalna banka (part of NLB Group) uses advanced data analytics for credit risk assessment, customer segmentation and personalization of financial products. The integration of large data sets and analytical models enables the improvement of decision-making quality, the reduction of information asymmetry and the optimization of risk management, which is a key factor in the stability and competitiveness of banking institutions in modern business conditions [2, p. 1-10; 21, p. 71-78; 22, p. 626-639].

In the retail sector, the company Delhaize Serbia (Maxi, Shop&Go) uses data analysis on consumer buying habits in order to optimize product assortment and layout in sales facilities. This directly affects the increase in sales and more efficient inventory management [24, p. 97-121; 33, p. 356-365; 34].

These examples confirm that data-driven management enables the transition from intuitive to analytical decision-making, which results in greater precision, faster response to changes and better business results.

Based on the conducted analysis, it can be concluded that the data-based decision-making process involves the integration of several stages, from data collection and processing, through analytical tools, to strategic decision-making and achieving business results. It is particularly important to emphasize that in the practice of companies in the Republic of Serbia, this process is implemented through various information systems and analytical tools you.

Because of all the above, it can be concluded that data-driven management has a transformative role in strategic decision-making. It enables fact-based decision-making, reduces risk, increases accuracy, and enables organizations to respond more quickly and efficiently to changes in the business environment. Thus, the data-driven approach becomes not only a tool for improving decision-making, but also a key factor in the competitiveness of modern companies.

4.2. How do business intelligence systems contribute to the sustainable growth and competitiveness of companies in Serbia?

The second research question related to the way in which business intelligence systems contribute to the sustainable growth and competitiveness of companies in the Republic of Serbia. The results indicate that BI systems enable the integration and analysis of data from different business functions, which leads to better coordination of activities and optimization of resources. In practice, companies that implement business intelligence tools (BI tools) achieve improvements in planning, cost control and performance management. In the context of Serbia, the greatest progress in the application of BI systems was recorded in large organizations, especially in the telecommunications, banking and trade sectors, where analytical tools are used to improve business processes and increase competitiveness. Thus, BI systems become an important factor of sustainable growth, because they enable long-term planning based on realistic indicators. Business intelligence (BI) systems represent a set of technologies, applications and processes that enable the collection, integration, analysis and visualization of data in order to support business decision-making. Their role in modern organizations comes to the fore especially in the context of sustainable growth and strengthening competitiveness, which is of particular importance for companies in the Republic of Serbia that operate in a dynamic and increasingly demanding market environment.

One of the key contributions of the BI system is reflected in the improvement of operational efficiency and optimization of business processes. By integrating data from different sources, such as financial systems, sales, marketing and logistics, BI systems enable a comprehensive insight into the company's operations. Based on this information, management can identify inefficiencies, reduce costs and improve productivity, which directly contributes to the sustainable growth of the organization [2, p. 1-10]. In addition, BI systems have a significant impact on increasing the competitiveness of companies. By analyzing market data and consumer behavior, organizations can better understand the needs of their users and tailor products and services to those needs. This ability to adapt to the market allows companies to achieve a competitive advantage and differentiate themselves from the competition [9, p. 13-28].

In the context of the Republic of Serbia, the application of BI systems is most pronounced in large companies and sectors with a high degree of digitization, such as banking, telecommunications and retail. In these sectors, BI tools are used to analyze consumer habits, manage risks and improve user experience. This enables not only an increase in efficiency, but also long-term sustainable development through better planning and strategic management [23; 22, p. 97-121; 24, p. 69-96].

Business intelligence systems play a significant role in improving the competitiveness of companies in Serbia, especially in sectors with a high level of digitization. For example, in the energy sector, the company NIS uses business intelligence systems to integrate data from different business functions, including manufacturing, logistics and distribution. Application of BI tools enables monitoring of key performance, optimization of operational processes and more efficient management of resources. Analytical insights based on data contribute to improving strategic planning and increasing operational efficiency, which is of key importance for the long-term sustainability and competitiveness of the company [Ibidem].

In the IT sector, the Comtrade company develops and implements solutions based on business intelligence and data analytics, thereby contributing to digital transformation and improving the competitiveness of organizations. Application of advanced analytical tools enables more efficient data management, optimization of business processes and making informed decisions based on data [24, p. 356-365; 22, p. 626-639].

Also, in the banking sector, Banca Intesa uses BI systems to analyze market trends, customer behavior and optimize business processes, which enables sustainable growth and strengthening of the market position. In the e-commerce sector, platforms like Ananas use advanced analytics to track user behavior and personalize offers, thus increasing competitiveness in the domestic market [Ibid, 23; Ibid, 22; Ibid, 24]. These examples indicate that BI systems enable organizations to use resources more efficiently, improve decision-making, and achieve long-term competitive advantage.

An important aspect of BI systems' contribution to sustainable growth is their role in strategic planning and long-term decision-making. By using historical and real-time data, organizations can develop strategies based on real indicators, which increases the probability of success and reduces the risk of wrong investment decisions. BI systems also enable monitoring of key performance indicators, which contributes to continuous business improvement [Ibid, 22].

However, the level of application of the BI system in Serbia is still not uniform. Small and medium-sized companies often fall behind in the implementation of these solutions due to limited resources, lack of professional staff and insufficient awareness of the importance of analytics in business. Despite this, trends indicate a gradual increase in the use of BI tools, which is associated with digital transformation processes and the increasing availability of technological solutions [25]. Also, BI systems play a significant role in business sustainability, as they enable more efficient management of resources and reduction of operational losses. Data analysis can help organizations to optimize energy consumption, improve logistics processes and reduce the negative impact on the environment, thus BI systems contribute not only to the economic, but also to the ecological aspect of sustainable development [26].

Based on the conducted analysis, it can be concluded that business intelligence systems are a key tool for improving competitiveness and sustainable growth of companies in the Republic of Serbia. Although there are certain limitations in their application, especially in the sector of small and medium enterprises, their role in modern business is becoming more and more important and represents an important direction of the future development of the domestic economy.

4.3. What are the main obstacles and challenges of implementing BI practices in the context of Serbian companies?

The third research question related to the identification of the main obstacles and challenges of the implementation of BI practices in Serbian companies. The analysis shows that the key challenges are related to insufficient development of digital infrastructure, limited financial resources and lack of professional staff for data analysis. In addition, an insufficiently developed organizational culture that does not encourage data-based decision-making is a significant obstacle. The resistance of employees to changes, as well as the lack of strategic management support, additionally slow down the implementation of the BI system. The implementation of business intelligence (BI) systems in modern organizations is a complex and multidimensional process that goes beyond the mere technical integration of software solutions. In the context of the Republic of Serbia, this process is additionally conditioned by the specifics of the economic environment, the level of digital transformation and the organizational capacities of the company. The analysis of the relevant literature points to several key categories of challenges that limit the wider and more effective application of BI practices. [25; 26]

One of the main obstacles relates to insufficiently developed digital infrastructure and technological readiness of the company. Although large companies in Serbia have implemented modern information systems to a significant extent, small and medium-sized businesses often do not have an adequate IT infrastructure to support complex BI solutions. This gap in technological development directly affects the ability to collect, store and process data, which is the basis for the application of business intelligence [Ibidem].

Another significant challenge is the lack of professional staff and analytical competences. The implementation of a BI system requires interdisciplinary knowledge in the field of information technology, statistics, data analysis and management. In Serbia, there is a deficit of experts who possess these competencies, which makes it difficult not only to implement, but also to effectively use BI tools in practice. This problem is particularly pronounced in smaller organizations that do not have the resources to hire or train specialized personnel [23].

In addition to technical and personnel limitations, an insufficiently developed organizational culture based on data is a significant obstacle. In many companies, decision-making is still based on the experience and intuition of managers, while the analytical approach is not used to its full capacity. Resistance to changes, lack of trust in data and weak communication between the IT sector and management additionally slow down the process of BI system implementation [11, p. 46-55].

Another important challenge is related to financial constraints. Implementation of a BI system requires significant investments in software, hardware, employee training and system maintenance. For many companies in Serbia, especially small and medium-sized ones, these costs represent a significant barrier, which is why the implementation of BI solutions is often delayed or completely absent [Ibidem].

Also, the quality and availability of data can be a problem. Inadequately collected, fragmented or unreliable data can lead to wrong analyzes and inadequate business decisions. In practice, many organizations do not have standardized data governance processes, which further complicates the implementation of a data-driven approach [19].

Finally, a significant challenge is the lack of strategic management support. Without a clear vision and commitment from the highest level of management, BI initiatives often remain at the level of technical projects without wider organizational application. Successful implementation requires the integration of the BI system into the business strategy, as well as continuous management support in the development of an analytical culture [5].

For example, many small textile companies in Serbia, although aware of the importance of digitization, do not have the capacity to implement complex BI systems, but rely on basic tools such as Excel analysis. This approach limits the possibility of strategic planning and reduces competitiveness [Ibid, 22; Ibid, 24]. Additionally, although companies like Telekom Srbija and NIS successfully implement BI solutions, challenges arise in the form of organizational resistance, insufficient system integration and the need for continuous employee education [Ibid, 22; 27, p. 81; 28; 31, p. 31-39]. According to the data of the Republic Statistical Office, a relatively small percentage of companies in Serbia use CRM and advanced analytical tools, which further confirms the existence of a digital gap between large and small companies [Ibid, 27; 32; 33, p. 91-127].

Despite the mentioned challenges, it is important to point out that the situation in Serbia is gradually changing. The processes of digital transformation, the development of the IT sector and the growing awareness of the importance of data contribute to the growing interest in BI solutions. However, for the full implementation and exploitation of the potential of business intelligence, it is necessary to systematically overcome the identified obstacles through investment in infrastructure, personnel training and the development of an organizational culture based on data.

Taken as a whole, the results these studies indicate that there is significant potential for improving business operations in Serbia through the application of data-driven management and business intelligence. Although certain challenges are present, trends indicate a gradual increase in the application of analytical tools and digital solutions, which can contribute to strengthening the competitiveness and sustainable development of domestic companies.

5. CONCLUSION

The modern business environment, marked by accelerated digitization and the growing amount of available data, imposes the need to transform traditional approaches to management. In this context, data-driven management and business intelligence systems stand out as key instruments for improving the quality of strategic decision-making and strengthening the company's competitive position. The results of the conducted analysis confirm that organizations that base their decisions on the systematic processing and interpretation of data achieve a higher level of efficiency, reduce uncertainty and increase the ability to adapt to dynamic market conditions.

The results of this theoretical-analytical study indicate that data-driven management and business intelligence systems have significant potential not only in improving business performance, but also in the further development of scientific thought in the field of management and economics. In a scientific-research context, the obtained findings contribute to the systematization of existing theoretical knowledge about the role of data analytics in strategic decision-making, as well as to the understanding of the interdependence between digital transformation, organizational culture and the competitiveness of companies. A special contribution is reflected in the integration of different conceptual approaches of data-driven management, business intelligence and user relationship management, which opens up space for further interdisciplinary research, especially in the domain of quantitative measurement of the effects of BI systems on the performance of organizations.

At the same time, the results of this work have significant applicable value in practice. Companies in the Republic of Serbia can use the identified findings as a basis for improving their own management models, especially in the segments of strategic planning, market analysis and customer relationship management. Examples of companies such as Telekom Srbija, NIS, NLB Komercijalna banka, Banca Intesa and trading companies indicate that the systematic application of analytical tools contributes to increasing efficiency, optimizing resources and strengthening the competitive position. It is especially important to emphasize that the integration of BI systems and CRM concepts enables organizations to develop a deeper understanding of user needs, which is the basis for long-term sustainability and market success.

In a practical sense, the results of the work can serve as guidelines for managers to make informed decisions about investing in digital technologies, developing analytical capacities and improving the organizational structure. They also point to the need for continuous education of employees and the development of a culture based on data, as key prerequisites for the successful implementation of a BI system.

Seen as a whole, this work confirms that the synergy between theoretical knowledge and practical application is the basis for further development of both science and modern business. It is precisely in this interconnection that the potential for creating innovative management models that will enable companies in the Republic of Serbia to successfully adapt to the challenges of the digital economy and achieve a sustainable competitive advantage lies.

This work has certain limitations that need to be taken into account. First of all, it is based on a theoretical-analytical approach and secondary data sources, without empirical verification of the results. Also, examples from practice in the Republic of Serbia have an illustrative character, which can limit the possibility of generalizing the conclusions. Further directions of research can also include the analysis of the role of organizational culture, leadership and digital competencies of employees in the process of BI system implementation, as well as the examination of the integration of business intelligence with the concepts of customer relationship management and artificial intelligence. A particularly significant research direction relates to the development of models that would enable the optimization of data use in the function of making strategic decisions and improving the competitiveness of companies.

Future research should be focused on empirical verification of the impact of data-driven management and business intelligence systems on company performance, using quantitative and qualitative methods. It is particularly important to investigate the differences between sectors and company sizes, as well as the role of organizational culture and employees' digital competencies in the successful implementation of these systems.

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DATA-DRIVEN МЕНАЏМЕНТ И ПОСЛОВНА ИНТЕЛИГЕНЦИЈА КАО ДЕТЕРМИНАНТЕ ОДРЖИВОГ РАСТА ПРЕДУЗЕЋА У РЕПУБЛИЦИ СРБИЈИ

Резиме: *У условима дигиталне трансформације и све веће тржишне неизвесности, дата-дривен менаџмент и системи пословне интелигенције (BI) постали су кључни инструменти за унапређење стратешког одлучивања и обезбеђивање одрживог раста предузећа. Предмет овог рада представља анализа улоге дата-дривен менаџмента и пословне интелигенције као детерминанти одрживог раста предузећа у Републици Србији. Циљ истраживања је да се испита теоријска основа ових концепта и оцени њихов значај за конкурентност и дугорочну стабилност пословања у привреди у транзицији. Истраживање је засновано на теоријско-аналитичком приступу, укључујући преглед релевантне домаће и међународне литературе, компаративну анализу, као и методе синтезе и дедукције. Резултати указују да ефективна интеграција BI алата у менаџерске процесе побољшава квалитет доношења одлука, смањује пословни ризик и јача конкурентску позицију предузећа. С друге стране, ограничена дигитална зрелост и недовољна аналитичка култура представљају значајне изазове у српским предузећима. Закључак рада је да систематска примена дата-дривен пракси представља стратешки предуслов за одрживи раст и дугорочни економски развој.*

Кључне речи: *data-driven менаџмент, пословна интелигенција, одрживи раст, стратешко одлучивање, дигитална трансформација, конкурентност, предузећа у Србији*

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STRATEGIC HUMAN RESOURCE PLANNING IN CRISIS SITUATIONS: A FRAMEWORK FOR ENHANCING ORGANIZATIONAL RESILIENCE

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Abstract: *Contemporary organizations operate in conditions of increased uncertainty, complexity, and frequent crises, which necessitates the transformation of traditional approaches to human resource management. In this context, strategic human resource planning represents a key mechanism for building organizational resilience and adaptability. The aim of this paper is to analyze the role of strategic human resource management in crisis conditions, with particular emphasis on workforce planning, competency development, and leadership. The paper argues that the integration of human resources into crisis management systems significantly enhances organizational stability and performance. The findings indicate that organizations that systematically develop strategic HR mechanisms demonstrate higher levels of flexibility, faster responses to crises, and greater long-term sustainability.*

Keywords: *strategic management, human resources, crisis, resilience, adaptability*

1. INTRODUCTION

The contemporary business environment is characterized by a high degree of uncertainty, dynamism, and complexity, which significantly affects organizational functioning [1], [2]. Crisis events, whether economic, health-related, security-related, or technological, are becoming increasingly frequent and pose continuous challenges for organizations [3]. As a result, organizations are required to develop new management approaches that enable them to respond effectively to rapidly changing conditions.

In such an environment, human resource management can no longer be viewed solely as an operational function, but rather as a key strategic component of organizational development and sustainability [4], [5]. Strategic human resource management enables organizations to align workforce policies with long-term objectives and to build adaptive capacities necessary for navigating uncertainty [6], [7].

Strategic human resource planning represents a process of aligning human capital with the long-term goals of the organization, while simultaneously anticipating future needs and potential risks. In crisis conditions, this function becomes even more critical, as it directly influences an organization's ability to respond to disruptions, maintain business continuity, and mitigate negative consequences.

Particular importance is attributed to the transformation of the HR function from an administrative role to a strategic one [8]. However, despite the formal adoption of strategic HR approaches, a significant gap often exists between defined strategies and their actual implementation in practice [9].

The aim of this paper is to analyze the importance of strategic human resource planning in crisis situations and to identify key factors that contribute to organizational resilience and adaptability. Special emphasis is placed on the integration of human resources into crisis management systems.

2. THEORETICAL FRAMEWORK

2.1. Strategic Human Resource Management in Contemporary Organizations

Strategic Human Resource Management (SHRM) represents one of the key concepts of modern management, based on the assumption that human resources are not merely an operational or administrative element of the organization, but rather a strategic asset that can serve as a source of sustainable competitive advantage. Unlike traditional human resource management, which is primarily focused on recruitment, record-keeping, compensation, and administrative support, SHRM emphasizes the alignment of HR policies with long-term organizational goals, mission, and strategic direction [6], [7].

The literature particularly highlights that a strategic approach to human resources is grounded in the concepts of "vertical fit" and "horizontal fit." Vertical alignment refers to the consistency between HR practices and the overall organizational strategy, while horizontal alignment denotes the internal coherence among HR practices such as selection, training, performance appraisal, compensation, and career development [10]. In crisis conditions, this alignment becomes even more critical, as fragmented or reactive HR mechanisms typically lead to organizational confusion, delayed responses, and weakened institutional resilience.

Contemporary organizations operate in environments characterized by globalization, digitalization, technological disruption, volatile labor markets, and increasingly frequent crises. In such conditions, SHRM acquires a new role: not only to ensure the placement of "the right person in the right position," but also to develop the organization's capacity for learning, adaptation, and rapid resource reconfiguration. For this reason, recent literature increasingly examines SHRM through the lens of dynamic capabilities, defined as the organization's ability to integrate, build, and reconfigure internal and external competencies in response to environmental changes [11], [12].

From this perspective, strategic human resource management in crisis situations involves more than simple workforce rationalization. It includes the development of mechanisms for early risk identification, competency building for crisis decision-making, enhancement of internal communication, succession planning, preservation of organizational knowledge, and ensuring the psychological and professional stability of employees. In practice, this implies that organizations must develop predefined scenarios for workforce shortages, operational disruptions, emergency redeployment of personnel, functioning in distributed teams, and operating under conditions of heightened stress.

However, although SHRM is often presented in the literature as a rational and highly efficient model, a critical perspective reveals that its practical implementation is not always consistent. In many organizations, HR strategies exist formally but are not fully integrated into key decision-making processes. The HR function often remains subordinate to operational management, lacking sufficient autonomy and access to strategic planning at the highest level. This becomes particularly problematic in crisis situations, where rapid and complex responses are required from HR without prior positioning as a strategic partner [13].

From a critical standpoint, one of the key challenges of SHRM is the risk of excessive instrumentalization of human resources. If employees are viewed solely as "resources" for achieving organizational goals, their psychological, ethical, and social dimensions are neglected. In crisis situations, this can lead to decreased motivation, increased stress, burnout, and resistance to change. Therefore, contemporary approaches increasingly emphasize sustainability, employee well-being, and the ethical dimension of human resource management [14], [15].

According to the theory of dynamic capabilities, organizations must continuously develop and adapt their resources in order to respond to environmental changes [11], [12]. In this context, human resources play a central role in fostering adaptability and innovation [13]. Furthermore, recent studies indicate that integrated HR systems have a significant impact on organizational performance and long-term sustainability [16].

The essential importance of SHRM in crisis situations lies precisely in the integration of strategic, adaptive, and human-centered approaches. Organizations that treat human resources as carriers of resilience, knowledge, and transformation, rather than merely as operational costs, are far more likely to withstand crises, maintain performance, and successfully transition into phases of recovery and development.

2.2. Crisis Management and The Role of Human Resources

Crisis management represents a systematic process of prevention, preparedness, response, and recovery from events that may seriously threaten an organization's operations, resources, reputation, security, or survival. Traditional models typically conceptualize crisis management through several phases: threat identification, preparation and planning, immediate response, stabilization, and post-crisis recovery [17]. However, contemporary approaches emphasize that crisis management is not merely a matter of procedures and operational protocols, but fundamentally a question of organizational capability to mobilize people, knowledge, and leadership under conditions of disruption.

In this context, human resources represent a central element of crisis management. No business continuity plan can be effective if employees are not adequately prepared, if roles and responsibilities are unclear, if leaders are not trained to operate under uncertainty, or if the organization lacks a culture of trust and coordination. For this reason, recent literature emphasizes that crisis management must be deeply integrated with SHRM practices [18], [3].

The COVID-19 pandemic provides a clear illustration of this relationship. Organizations that had already developed remote work practices, flexible workforce models, internal communication systems, and rapid reskilling capabilities demonstrated significantly higher levels of resilience compared to those with rigid structures and limited digital readiness. In many cases, business continuity depended less on technology itself and more on the ability of human resources to reorganize quickly, adopt new work patterns, and maintain functionality under conditions of high stress and uncertainty [19].

This is particularly evident in sectors such as healthcare, security, logistics, and critical infrastructure. In such environments, the human factor plays a dual role: it is both the primary agent of crisis response and a subject exposed to the consequences of crisis, including exhaustion, pressure, risk, ethical dilemmas, and potential burnout. Therefore, crisis management that neglects the human dimension remains inherently incomplete.

From a strategic perspective, the role of HR in crisis management encompasses several interrelated functions. First, workforce risk assessment involves identifying critical roles, evaluating workforce vulnerability, and planning contingency solutions. Second, competency development includes training for crisis response, decision-making under pressure, leadership in uncertainty, and internal coordination. Third, the communication function is crucial, as timely and reliable information flow is essential for maintaining trust and discipline within the organization. Fourth, HR plays a key role in post-crisis stabilization, including restoring motivation, reintegrating teams, and preserving organizational knowledge.

Despite this, many organizations still fail to fully recognize the importance of HR in crisis management. Crisis teams are often dominated by operational, financial, technical, and security experts, while the human dimension is treated as secondary. As a result, organizations may have plans for technical continuity, but not for workforce continuity. Moreover, the importance of psychological resilience, emotional strain, and interpersonal dynamics is often underestimated, even though these factors are frequently decisive in determining success or failure during crises.

An additional challenge is that crisis management in many organizations remains reactive rather than proactive. Instead of systematically building crisis capabilities in advance, organizations tend to respond only after disruptions occur. From a human resource perspective, this means that recruitment, training, leadership development, and contingency workforce planning are often implemented too late. Both research and practice indicate that the most successful organizations are those that treat crises not as exceptions, but as realistic scenarios for which they prepare systematically [3].

Therefore, crisis management and human resource management should not be viewed as separate systems. Their integration represents a fundamental prerequisite for organizational resilience. When HR becomes an active participant in the design of crisis strategies, organizations are more likely not only to survive crises, but also to emerge from them with stronger capabilities, greater internal cohesion, and a higher level of organizational learning.

2.3. Organizational Resilience and Adaptability

Organizational resilience refers to the ability of an organization to absorb disruptions, adapt to change, maintain core functions during crises, and recover or even improve its performance afterward. In contemporary literature, this concept is increasingly associated with adaptability, organizational learning, and dynamic capabilities, as resilience is not merely about "withstanding shocks," but also about the capacity for transformation under pressure [30]. Organizational resilience involves not only recovery, but also adaptation and transformation in crisis conditions [21].

Modern approaches emphasize the importance of sustainable human resource management [20] and employee well-being [14], while resilience itself is closely linked to human resources as key carriers of adaptive capacity [13].

From this perspective, organizational resilience should not be understood as a passive ability to maintain the status quo, but as an active capacity to reconfigure systems under conditions of instability. This includes the ability to recognize early signals of disruption, adjust organizational structures, reallocate resources, activate backup capacities, and, when necessary, redefine priorities. In all these processes, human resources play a crucial role.

Strategic human resource planning and organizational resilience are closely interconnected, as human capital represents the foundation of organizational knowledge, cross-functional coordination, innovative response, and operational stability. An organization may possess advanced technology, financial resources, and formal procedures, but without capable, motivated, and well-trained employees, its resilience remains limited. Consequently, numerous studies emphasize that organizational resilience cannot be fully understood without analyzing workforce capabilities, organizational culture, and leadership mechanisms [13].

From the perspective of adaptability, a particularly important capability is the organization's ability to learn quickly and adjust to new circumstances. Resilient organizations are not defined solely by plans and protocols, but also by a strong culture of feedback, openness to change, institutional learning, and innovation. For example, companies that rapidly transitioned to hybrid work models, implemented digital HR platforms, and redefined managerial practices during the pandemic demonstrated higher levels of adaptive maturity compared to those that attempted to return to pre-crisis models without meaningful adjustments.

However, a critical perspective reveals that the concept of resilience is often used in a normative and declarative manner. Many organizations emphasize resilience in strategic documents without developing operational mechanisms to support it. In practice, resilience is frequently reduced to employees' ability to "endure more" and "be more flexible," while inefficient processes remain unchanged, training investments are insufficient, contingency workforce capacities are underdeveloped, and systemic vulnerabilities are not addressed. Such an approach is problematic, as it shifts responsibility from the organization to the individual, rather than treating resilience as a systemic organizational capability.

Another important issue concerns the relationship between resilience and performance standards. In some organizations, resilience is interpreted as constant availability, extreme flexibility, and acceptance of increased workloads, which may lead to long-term negative consequences such as decreased job satisfaction, burnout, higher turnover, and reduced organizational commitment. This finding is consistent with research indicating that effective human resource management has a direct impact on organizational performance [23]. Therefore, contemporary approaches emphasize that resilience must be based on sustainable HR policies, psychological support, sound leadership practices, and a balance between operational demands and employee well-being [22].

In this sense, organizational resilience is not rigidity, but intelligent elasticity. It implies the ability of the system not to break under pressure, but also not to remain unchanged when change is necessary. This is where strategic human resource planning gains its full significance: it creates the conditions for organizations to rely not on improvisation or individual heroism, but on systematically developed competencies, structures, and practices.

3. STRATEGIC HUMAN RESOURCE PLANNING IN CRISIS CONDITIONS

3.1. Workforce Planning Under Conditions of Uncertainty

Strategic human resource planning in crisis conditions requires a systematic approach that includes the analysis, planning, and control of workforce capacities [24], [25]. Organizations that apply scenario-based planning demonstrate higher levels of resilience [17], whereas those that rely on short-term measures, such as cost reduction, often undermine their own capabilities [29]. The development of competencies represents one of the most critical determinants of organizational success [26], while digital competencies are becoming increasingly important in contemporary conditions [27], [28].

From a theoretical perspective, workforce planning in crisis situations must encompass at least four key dimensions: the identification of critical functions, the assessment of workforce vulnerability, the capacity for internal mobility, and the organization's ability to rapidly provide replacements or reallocate human resources. This implies that organizations must understand not only the number of employees they have, but also where their critical points of dependency lie, how teams rely on key individuals, which competencies are essential, and how they can be substituted under disruptive conditions.

Practical evidence from multiple sectors demonstrates that the absence of such planning leads to significant operational challenges.

During the pandemic, many healthcare systems and public services faced not only shortages in personnel numbers, but also a lack of specific competencies at critical moments. Similarly, in the private sector, organizations that depended on a limited number of individuals in key roles exhibited greater vulnerability when faced with illness, absenteeism, turnover, or structural changes in work organization. This suggests that workforce planning in crisis conditions must be based on functional rather than purely nominal logic: it is not sufficient to fill positions; it is necessary to ensure continuity of critical functions.

Furthermore, scenario-based planning becomes particularly important under crisis conditions. Organizations should develop multiple workforce scenarios ranging from minor disruptions to extreme events and define corresponding response measures. These may include reduced staffing models, remote work arrangements, temporary redeployment, reskilling initiatives, and shifts in responsibility structures. For instance, organizations that had developed even minimal remote work and digital collaboration scenarios prior to the pandemic were significantly better positioned than those attempting to implement such systems during the crisis itself.

From a critical perspective, workforce planning is often mistakenly equated with cost-cutting. In crisis situations, many organizations instinctively reduce staff numbers, suspend training programs, and freeze development initiatives. While short-term cost reduction may be justified, such an approach can weaken long-term organizational resilience. Organizations that fully reduce investments in people during crises effectively diminish their own capacity for recovery and adaptation. Therefore, contemporary research emphasizes that crises should not be viewed solely as moments of reduction, but also as opportunities for strategic reconfiguration of human resources [29].

Additionally, workforce planning in crisis conditions must address talent retention. During periods of instability, the most valuable employees are often the most sought-after in the labor market, increasing the risk of turnover. If organizations fail to maintain motivation, perceived fairness, communication clarity, and a sense of security among key employees, they risk losing precisely those individuals who are most critical for recovery. Thus, workforce planning in crisis conditions is not merely a quantitative issue, but also a qualitative matter of organizational trust and the preservation of critical competencies.

3.2. Competency Development and Training in Crisis Conditions

Competency development in crisis conditions represents one of the most important prerequisites for organizational resilience. Crises often reveal that organizations fail not only due to a lack of resources, but also due to insufficient preparedness of employees to operate under new and non-standard conditions. Therefore, training and competency development extend beyond pedagogical or HR concerns and become a matter of strategic organizational capability.

In a broad sense, crisis situations require a combination of technical, cognitive, communication, and psychological competencies. Technical competencies include knowledge of procedures, safety protocols, digital tools, and operational mechanisms. Cognitive competencies involve decision-making under uncertainty, risk assessment, rapid situation analysis, and prioritization. Communication competencies encompass clear information exchange, team coordination, and conflict management. Psychological competencies relate to stress management, emotional stability, resilience, and the ability to maintain functionality under prolonged disruption.

A common issue in practice is that organizational training is often reduced to formal compliance activities, without meaningful alignment with crisis scenarios. Many organizations implement training programs that meet regulatory requirements but fail to ensure actual preparedness for high-pressure situations. In contrast, organizations that utilize simulations, case studies, interdisciplinary workshops, and crisis exercises achieve significantly higher levels of practical readiness. Sectors such as aviation, the military, and emergency services provide strong examples of training systems focused not only on procedural knowledge, but also on performance in unpredictable environments.

Digital competency has become a particularly critical aspect of modern training. As crises are increasingly associated with technological disruptions, cyber risks, and remote collaboration, the ability to effectively use digital tools is essential for organizational preparedness. The pandemic clearly demonstrated that organizations with higher levels of digital maturity transitioned more effectively to new working models, maintained communication continuity, and reorganized processes more efficiently. Consequently, training can no longer be limited to task-specific competencies, but must also include digital flexibility as a general organizational capability [28], [27].

However, not all organizations are capable of systematically investing in human capital development, especially during crises. Budget constraints, operational pressures, and short-term managerial orientations often lead to reduced investment in training precisely when it is most needed. Furthermore, some organizations treat training as an isolated activity rather than as part of a broader system of organizational learning. If training is not aligned with job design, reward systems, performance evaluation, and leadership expectations, its impact remains limited.

Another important issue concerns the fairness and inclusiveness of training programs. In some organizations, crisis training and development opportunities are primarily available to managers and selected employees, while operational and middle-level staff remain insufficiently prepared. This creates a dangerous organizational asymmetry: leadership possesses knowledge, but the broader system lacks the capacity to implement it. Therefore, strategic human resource planning must ensure that competency development is distributed both horizontally and vertically, enabling the entire organization not just selected segments to develop crisis capabilities.

3.3. Leadership in Crisis Situations

Leadership in crisis situations is one of the most extensively studied, yet frequently oversimplified aspects of organizational management. In public discourse, crisis leaders are often portrayed as strong individuals who make quick decisions and maintain control. While decisiveness is important, academic literature suggests that effective crisis leadership is a far more complex phenomenon involving strategic judgment, emotional stability, communication precision, moral integrity, and the ability to maintain trust [18].

Within the context of human resource management, crisis leadership is not merely an individual trait, but an institutional capability. It reflects the organization's ability to develop individuals at multiple levels who can act effectively under conditions of uncertainty. This implies that strategic human resource planning must include the identification of leadership potential, systematic managerial development, succession planning, and the creation of a culture in which leadership is not solely based on formal hierarchy, but also on the functional capacity to assume responsibility in critical situations.

Practical experience indicates that the most effective leaders in crises are those who can balance clarity and flexibility. Clarity is essential for reducing uncertainty, preventing misinformation, and maintaining discipline, while flexibility is necessary because crises rarely follow predictable patterns and often require rapid adjustments. For example, during health and security crises, organizations frequently had to modify protocols, team rotations, communication channels, and operational priorities within short timeframes. Leaders who rigidly adhered to predefined rules were generally less effective than those who maintained structure while allowing for adaptive responses.

From a critical perspective, one of the major challenges of crisis leadership is the tendency toward excessive centralization of decision-making. While centralized coordination may be necessary in the early stages of a crisis, prolonged concentration of decision-making at the top can lead to leadership overload, slower response times, and reduced initiative at lower organizational levels. Consequently, contemporary models of resilience increasingly emphasize the importance of distributed leadership, where multiple organizational levels are empowered to act within clearly defined principles.

Communication represents another critical dimension of crisis leadership. In crisis situations, communication functions both as an operational and psychological tool. Unclear, contradictory, or delayed messages can lead to panic, reduced trust, and weakened discipline. Conversely, overly optimistic or defensive communication may undermine credibility. Effective crisis leadership requires realistic, timely, and consistent communication that combines factual accuracy with the ability to mobilize employees and sustain organizational cohesion.

From a strategic HR perspective, it is essential that crisis leadership is not left to chance. Organizations that proactively develop leadership capabilities through mentoring, simulations, leadership programs, and succession planning are significantly more likely to maintain stability during disruptions. Where leadership is treated as a function of formal authority or personal charisma rather than systematic development, organizations become dependent on individuals and therefore more vulnerable.

4. CONCEPTUAL MODEL AND CRITICAL INTERPRETATION

Based on the preceding theoretical analysis, a conceptual model can be formulated in which strategic human resource planning represents the independent variable, organizational adaptability functions as the mediating mechanism, and organizational resilience and performance stability in crisis situations represent the dependent outcomes. In other words, the model is grounded in the assumption that the mere existence of a strategic HR plan is insufficient unless the organization develops the capacity to translate that plan into adaptive mechanisms of action.

Accordingly, the conceptual model of the research is based on the following relationship:

SHRM → Adaptability → Organizational Resilience → Performance

Adaptability acts as a mediating factor that enables the transformation of strategy into measurable outcomes [12]. Organizations that develop adaptive capacities demonstrate a greater ability to respond to crises and maintain operational stability [30]. At the same time, it is important to emphasize that human resources are not the sole determinant of organizational resilience. Organizational structure, technology, and leadership also exert a significant influence [1].

This logic is important because it highlights the distinction between formal and functional SHRM. Formal SHRM refers to the existence of strategies, procedures, and formal documents, whereas functional SHRM reflects the organization's actual ability to mobilize people, redefine priorities, and maintain continuity during crisis situations. Adaptability represents the key mediating dimension between these two levels.

More specifically, the model is based on the assumption that if an organization systematically plans its human resources through the identification of critical roles, the development of multi-skilled competencies, leadership development programs, contingency workforce scenarios, and communication protocols, its level of adaptability will increase. Increased adaptability enables faster responses, reduces the degree of disorganization, ensures better preservation of core functions, and contributes to more stable performance in crisis situations. Therefore, it is not the strategy itself that directly generates resilience, but rather the way in which it creates the capacity for adaptation.

This conceptualization also has broader theoretical significance, as it connects SHRM literature with the theory of dynamic capabilities and organizational resilience. Instead of viewing human resources solely as an object of planning, the model conceptualizes them as active drivers of organizational change. This represents one of the key contributions of this study.

However, a critical perspective requires caution in oversimplifying this relationship. Organizational resilience does not depend solely on human resources. It is also influenced by organizational structure, financial stability, technological capabilities, the quality of top-level decision-making, institutional context, and external shocks. Therefore, strategic human resource planning should be understood as a necessary, but not sufficient, condition for organizational resilience. In other words, a strong HR system cannot fully compensate for weak organizational architecture, although it can significantly mitigate its negative effects.

Furthermore, it is important to critically examine the limits of transferring this model across different sectors. For example, HR strategies that produce strong results in highly regulated systems, such as the military or healthcare, may not be equally effective in private sector organizations operating in more dynamic and market-driven environments. Consequently, this model should be viewed as a general analytical framework, the practical application of which requires sector-specific adaptation.

Another important critical aspect concerns the risk of normative idealization of SHRM. Assuming that every improved HR strategy will automatically lead to greater resilience neglects the real constraints within organizations, such as cultural resistance to change, informal power structures, uneven managerial competencies, and implementation limitations. In practice, organizations often possess well-designed strategies on paper, but lack effective mechanisms for execution. Therefore, it is essential that this conceptual model does not remain at the declarative level, but serves as a stimulus for a thorough reassessment of internal organizational capabilities.

5. RESULTS AND DISCUSSION

The results of the theoretical analysis indicate that strategic human resource planning in crisis situations cannot be reduced to operational workforce adjustments, but rather represents a broader systemic mechanism of organizational resilience. When examining contemporary crises ranging from pandemics and cyberattacks to security threats and economic shocks, it becomes evident that organizations do not primarily fail due to a lack of procedures, but rather due to insufficiently developed human and leadership capacities to implement them effectively.

The findings suggest that organizations that integrate human resource management into strategic decision-making processes achieve superior outcomes [7], [31]. However, human resources alone are insufficient without accompanying structural and cultural transformations [22]. In this context, the ethical dimension of human resource management is particularly significant, as decisions made under crisis conditions have long-term consequences for both organizations and employees [15].

In this regard, the findings support the position in the literature that human resources represent key drivers of institutional adaptation. Organizations that develop structured workforce planning systems, continuous training programs, crisis-oriented leadership, and a culture of trust are better positioned to respond rapidly to disruptions and maintain operational stability. This is consistent with the findings that HR systems constitute a fundamental component of resilience rather than a supporting function [13].

A particularly important contribution of this study lies in the argument that adaptability plays a mediating role in the relationship between strategic human resource planning and crisis outcomes. This perspective shifts the analytical focus from the formal existence of strategies to the functional capacity of organizations to implement them. An organization may possess a well-designed strategic plan; however, without developed adaptive capabilities, such as adequately trained personnel, efficient communication systems, and leadership capable of operating under uncertainty the practical impact of that strategy remains limited. Therefore, adaptability can be understood as the key mechanism through which HR strategy is translated into organizational resilience.

At the same time, a critical perspective requires caution regarding overly optimistic interpretations of SHRM in the literature. In some cases, SHRM is presented as a universal solution to organizational challenges, which is not entirely sustainable. While human resources can significantly strengthen organizational resilience, they cannot substitute for structural and institutional prerequisites of effective organizations. In situations where leadership is unclear, resources are insufficient, procedures are inconsistent, or internal trust is low, HR interventions alone are unlikely to produce substantial improvements.

Furthermore, crisis contexts often generate complex ethical dilemmas in the domain of human resource management. Under pressure, organizations may resort to measures such as intensified workloads, workforce reductions, expanded job roles, or increased employee monitoring through digital technologies. Although such measures may be justified by short-term survival needs, they can undermine trust, organizational justice, and employee motivation in the long run. Therefore, strategic human resource planning in crisis conditions must incorporate a strong ethical dimension, ensuring not only efficiency but also the legitimacy of organizational actions.

The practical implications of this study are multifaceted. First, organizations should develop workforce scenarios for different types of crises rather than relying solely on ad hoc responses. Second, training programs should be oriented toward real crisis-related competencies rather than merely fulfilling formal job requirements. Third, leadership capacities must be developed across multiple hierarchical levels to avoid excessive dependence on a limited number of individuals. Fourth, organizational resilience should be built through a balanced combination of adaptability, ethical responsibility, and employee well-being, rather than solely through increased pressure and performance demands.

All of the above indicates that strategic human resource planning in crisis situations is not a peripheral issue of organizational management, but one of its central pillars. Where this function is well-developed, organizations are more likely not only to survive crises, but also to use them as opportunities for institutional learning, organizational transformation, and long-term capacity development.

6. CONCLUSION

The analysis of the role of strategic human resource planning in crisis situations indicates that this function represents one of the key pillars of contemporary organizational management. In conditions of increased uncertainty, organizations can no longer rely solely on technical, financial, or structural mechanisms, but must also develop human and institutional capacities that enable adaptability and resilience.

The findings of this study demonstrate that strategic human resource management has a significant impact on an organization's ability to respond to crises, maintain business continuity, and mitigate negative consequences. Particular emphasis is placed on the role of adaptability as a mediating mechanism linking strategic planning with organizational resilience. In other words, it is not sufficient for an organization to possess a strategy; it must also have the capacity to effectively implement that strategy in a dynamic and uncertain environment.

A critical perspective reveals that, in practice, a gap often exists between the formal presence of HR strategies and their actual implementation. The practical implications of this study suggest that organizations should develop systemic HR management mechanisms, including scenario-based planning, continuous competency development, strengthening of leadership capacities, and the enhancement of organizational culture. In addition, the integration of ethical principles into human resource management is of particular importance, ensuring not only efficiency but also the long-term sustainability of organizational decisions.

From a theoretical standpoint, this study contributes to the integration of the SHRM concept with the theories of organizational resilience and dynamic capabilities, highlighting the role of human resources as a key driver of adaptability. Future research should focus on the empirical validation of the proposed model, as well as on the analysis of sector-specific characteristics in the application of strategic human resource management under crisis conditions.

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СТРАТЕШКО ПЛАНИРАЊЕ ЉУДСКИХ ПОТЕНЦИЈАЛА У КРИЗНИМ СИТУАЦИЈАМА: ОКВИР ЗА ЈАЧАЊЕ ОРГАНИЗАЦИЈСКЕ ОТПОРНОСТИ

Резиме: *Савремене организације делују у условима повећане неизвесности, комплексности и учесталих кризних поремећаја, што намеће потребу за трансформацијом традиционалних приступа управљању људским ресурсима. У том контексту, стратегијско планирање људских ресурса представља један од кључних механизама изградње организационе отпорности и адаптибилности.*

Циљ рада је анализа улоге стратегијског управљања људским ресурсима у кризним условима, са посебним освртом на планирање кадрова, развој компетенција и лидерство. Рад се заснива на теоријској анализи релевантне литературе из области стратегијског менаџмента, организационе отпорности и управљања кризама.

Резултати указују да организације које систематски развијају стратегијске ХР механизме остварују већи степен флексибилности, бржу реакцију на кризе и стабилније перформансе. Посебно је истакнута улога адаптибилности као посредујућег механизма који повезује стратегијско планирање са организационом отпорношћу.

Практичне импликације рада указују на значај развоја сценаријског планирања, континуиране едукације запослених, јачања лидерских капацитета и изградње организационе културе засноване на поверењу и сарадњи. Такође, наглашена је потреба за интеграцијом етичких принципа у управљање људским ресурсима, посебно у кризним условима.

Закључује се да стратегијско планирање људских ресурса представља један од кључних фактора организационе отпорности и да омогућава организацијама не само да преживе кризе, већ и да их искористе као прилику за институционално учење и развој.

Кључне речи: *стратешки менаџмент, људски ресурси, криза отпорност, прилагодљивост*

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RISK MANAGEMENT IN THE PUBLIC SECTOR OF SERBIA AND CROATIA: A COMPARATIVE ANALYSIS OF FORMAL AND PROCESS MATURITY

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Abstract: *Risk management in the public sectors of Serbia and Croatia is examined by distinguishing between the formal establishment of risk management instruments and their process maturity in practical application. It starts from the assumption that the existence of strategies, guidelines, risk registers and reporting templates represents an important, but not sufficient, condition for effective risk management. The actual maturity of the system is reflected in whether these instruments are used in planning, decision-making, monitoring of weaknesses, implementation of corrective measures and assessment of remaining, or residual, risk. The aim of the research is to compare the available indicators of risk management development in the public sectors of Serbia and Croatia, with particular emphasis on the difference between formally established instruments and their process usability. The methodology is based on a comparative analysis of official reports, guidelines and publicly available documents relevant to financial management, internal control and risk management. In the case of Serbia, the analysis focuses on direct quantitative indicators, such as the adoption of risk management strategies, preparation of risk registers and use of risk management guidelines. In the case of Croatia, the analysis focuses on process indicators, including the Statement of Fiscal Responsibility, the Fiscal Responsibility Questionnaire, identified weaknesses in internal controls, internal audit opinions and activities aimed at developing integrated risk management. The expected contribution of the paper lies in a clearer understanding of the relationship between formal institutionalisation and the practical use of risk management as an instrument of managerial accountability, more efficient use of public resources and improved public governance.*

Keywords: *risk management; public sector; risk register; residual risk; internal controls; formal maturity; process maturity*

1. INTRODUCTION

The efficiency of the public sector largely depends on the ability of institutions to achieve their objectives while using resources rationally, complying with regulations, ensuring transparency, and maintaining accountability to citizens. In such an institutional environment, risk management represents one of the key elements of financial management and control [11], as it enables potential threats to be identified, assessed, treated, and monitored in a timely manner. Its purpose is not merely to avoid undesirable events, but also to provide a basis for better managerial decision-making, more effective allocation of control activities, and the strengthening of managerial accountability[3].

In practice, however, public institutions often face a gap between the formal establishment of risk management systems and their actual process maturity. Formal maturity refers to the existence of prescribed documents, strategies, guidelines, risk registers, and reporting templates. Process maturity, on the other hand, refers to the extent to which these instruments are genuinely integrated into management processes, planning, decision-making, monitoring of measures, and reporting on results. This distinction represents the starting point of this paper.

The way in which risks are documented and monitored is of particular importance. The risk register, as one of the main instruments of risk management, should not be understood merely as a formal list of potential threats, but as a working management document that links objectives, processes, risks, existing controls, planned measures, responsible persons, deadlines, and implementation status[16]. Its value lies in enabling management to determine which risks are the most significant, where existing controls are insufficient, which measures should be undertaken, and whether the remaining level of risk is acceptable after those measures have been implemented.

In this context, the distinction between inherent and residual risk is especially important. Inherent risk refers to the initial level of exposure before the application of controls and measures, while residual risk represents the remaining level of risk after existing controls and planned activities have been taken into account[22]. If residual risk is not clearly documented, risk management may remain at the level of an administrative obligation, without providing a clear insight into whether controls and measures have actually contributed to reducing risk exposure.

The subject of this paper is risk management in the public sectors of Serbia and Croatia, with particular emphasis on the formal and process maturity of methodological and reporting mechanisms. The selection of Serbia and Croatia is based on their regional and institutional comparability, as well as on the fact that both countries are developing systems of internal control and public internal financial control in line with European principles, the COSO framework, and the concept of managerial accountability [6][4][5]. At the same time, publicly available documents indicate different ways of monitoring and presenting the development of these systems. In Serbia, direct indicators are available regarding the adoption of risk management strategies, the preparation of risk registers, and the use of guidelines[15]. In Croatia, the state of the system is assessed more through the Statement of Fiscal Responsibility, the Fiscal Responsibility Questionnaire, plans for eliminating weaknesses, internal audit opinions, and activities aimed at introducing integrated risk management[13].

The aim of the research is to compare the key elements of risk management in the public sectors of Serbia and Croatia, focusing on the difference between formally established instruments and their process usability. The research seeks to determine the extent to which available documents and reporting mechanisms provide insight into the maturity of risk management, the documentation of risks, the monitoring of weaknesses, the planning of corrective measures, and the connection between risk management and managerial decision-making.

Accordingly, the paper is based on the following research questions:

- What are the key indicators of the formal establishment of risk management in the public sector of Serbia?
- How are weaknesses and risk areas in Croatia's internal control system identified through the mechanisms of fiscal responsibility, self-assessment, and internal audit?
- To what extent can a transition be observed in the analysed systems from the formal documentation of risks towards the process integration of risk management into planning, control, and decision-making?
- What are the similarities, differences, and limitations of the available indicators for assessing the maturity of risk management in Serbia and Croatia?

Methodologically, the paper is based on a comparative analysis of publicly available official documents, reports, guidelines, and templates relevant to financial management, internal control, and risk management. The analysis is carried out using a criteria-based instrument that includes two groups of indicators: indicators of formal maturity and indicators of process maturity. Indicators of formal maturity refer to the existence of a risk management strategy, risk register, guidelines, and reporting templates. Indicators of process maturity refer to the monitoring of weaknesses, planning and implementation of measures, involvement of internal audit, follow-up of recommendations, status of eliminating irregularities, and the integration of risk management into management processes.

The expected contribution of the paper lies in providing a clearer distinction between formal and process maturity of risk management in the public sector. The paper argues that the mere existence of a strategy or risk register is not sufficient for assessing the actual maturity of the system. It is also necessary to analyse whether risks are monitored, whether measures are implemented, whether responsibility for action is clearly assigned, and whether results are used in managerial decision-making. In this way, the research may contribute to a better understanding of how risk management in the public sector can evolve from a formal obligation into a practical instrument of managerial accountability and improved public governance.

2. FORMAL AND PROCESS CONDITIONS FOR EFFECTIVE RISK MANAGEMENT IN THE PUBLIC SECTOR

Effective risk management requires more than the formal existence of procedures, registers, or reporting templates. It is based on a clear connection between institutional objectives, identified risks, existing controls, planned measures, and continuous monitoring. Risk should therefore be understood not only as a potential threat, but also as a managerial category linked to decision-making under uncertainty [22]. In this sense, risk management enables public sector institutions to anticipate events that may prevent the achievement of objectives, but also to identify opportunities for improving performance, efficiency, and accountability [2].

A fundamental precondition for risk assessment is the clear definition of objectives. If institutional objectives are not clearly formulated, it is difficult to determine which events may threaten their achievement and how significant those events may be. Risk assessment is therefore meaningful only when risks are analysed in relation to objectives, processes, resources, and expected results[20]. In this context, the impact of a risk represents the possible consequence for the achievement of objectives, while likelihood indicates the probability that the risk will materialise. The combination of these two dimensions enables institutions to rank risks and focus resources on those areas where exposure is the greatest.

Another important condition for effective risk management is the existence of appropriate controls. Controls reduce uncertainty and help keep risks within an acceptable level. However, controls should not be understood as an end in themselves. Excessive or poorly designed controls may slow down processes and reduce organisational efficiency, while insufficient controls may leave institutions exposed to unacceptable levels of risk [19]. For that reason, risk management requires a balanced approach: controls should be proportionate, purposeful, and directed towards the most significant risks[10].

The distinction between inherent and residual risk is particularly important for assessing the maturity of a risk management system. Inherent risk refers to the level of exposure before controls are applied, while residual risk refers to the level of exposure that remains after controls and risk treatment measures have been implemented [5]. This relationship may be expressed through the basic logic that inherent risk, reduced by controls, results in residual risk. Therefore, a mature risk management system should not only identify and assess risks, but also show whether existing controls and planned measures actually reduce exposure to an acceptable level[6].

The risk register has a central role in this process. It serves as a structured document that records the results of risk identification, assessment, treatment, and monitoring. A well-designed risk register should include the description of the risk, the objective or process to which it relates, the assessment of likelihood and impact, existing controls, planned measures, responsible persons, deadlines, implementation status, and the level of residual risk[16]. In this way, the register becomes more than an administrative form; it becomes a managerial tool that supports accountability, prioritisation, and follow-up [8].

A further process condition is the regular updating of the risk register. Risks change as objectives, regulations, organisational structures, personnel, information systems, technologies, and external conditions change. For this reason, risk management cannot be reduced to a one-time exercise. It must be embedded in regular planning, monitoring, reporting, and internal review. A system that only records risks once, without reviewing changes in exposure or the effectiveness of controls, remains formally established but processually weak[10].

Finally, internal audit has an important role in strengthening risk management maturity. By assessing internal controls, reviewing risk management processes, and providing assurance and recommendations, internal audit contributes to the reliability of the system. Its role is not to take over managerial responsibility for risks, but to provide independent insight into whether the risk management process is adequately designed and effectively implemented [22]. This is especially important in the public sector, where risk management is closely connected with legality, efficiency, accountability, and the responsible use of public resources.

2.1. Integrating risk management into public sector governance and decision-making

Effective risk management in the public sector requires more than the formal adoption of risk policies and reporting templates. It depends on the extent to which risk management is embedded in regular institutional processes, policy design, programme implementation and managerial decision-making [21]. Public sector organisations are expected to understand not only their formal responsibilities, but also the risks that may prevent them from achieving policy and organisational outcomes. In this sense, risk management should be treated as a continuous managerial process rather than as an isolated compliance exercise.

A process-oriented approach requires several institutional conditions[14]: the existence of a risk management policy and framework, clearly defined responsibility for managing risk, systematic integration of risk management into business processes, a positive risk culture, communication and consultation about risks, management of shared risks, maintenance of risk management capability, and regular review and continuous improvement of the system. These elements show that the maturity of risk management cannot be assessed only by the existence of formal documents, but also by the way in which risks are understood, communicated, monitored and used in decision-making.

The logic of a process-oriented approach can also be illustrated through risk-based compliance models. Such models show that institutional responses should be proportionate to the assessed level of risk and behaviour of regulated or controlled actors. Where actors are willing to comply, the appropriate institutional response is to make compliance easier and provide support[1]. Where actors are unwilling or deliberately refuse to comply, stronger detection and enforcement mechanisms are required[1]. This illustrates an important feature of mature risk management: controls and corrective actions should not be applied uniformly, but should be adjusted according to the level and nature of risk.

In the context of public sector governance, this model supports the distinction between formal and process maturity. A formally established system may contain policies, registers and templates, while a process-mature system [9] uses risk assessment results to prioritise controls, differentiate institutional responses, allocate resources and monitor the effectiveness of measures.

This distinction is particularly relevant for public sector organisations, where risks are often linked not only to financial loss, but also to legality, service delivery, public trust, integrity, policy implementation and the efficient use of public resources. Therefore, the quality of risk management should be assessed through both dimensions: the existence of formal instruments and the extent to which those instruments influence managerial behaviour and decision-making. A risk register, for example, has limited value if it is prepared only to satisfy reporting requirements. Its practical value depends on whether it is regularly updated, whether risk owners are clearly identified, whether mitigation measures are monitored, and whether the information it contains is used to guide institutional priorities.

Consequently, effective risk management in the public sector requires a shift from a compliance-based approach to a management-based approach. The compliance-based approach focuses primarily on whether required documents exist, while the management-based approach examines whether risk information is used to improve planning, strengthen controls, prevent weaknesses and support accountability[18]. This shift is essential for transforming risk management from a formal administrative obligation into a practical tool of public governance.

3. THE RISK REGISTER AS A TOOL FOR EFFECTIVE MANAGEMENT IN THE PUBLIC SECTOR

The risk register represents one of the key formal instruments of risk management in the public sector. It is a structured document or database in which identified risks are recorded, assessed, assigned to responsible persons and monitored over time[16]. Its purpose is not only to provide a list of potential threats, but to create a systematic basis for managing risks that may affect the achievement of institutional objectives, the implementation of public policies, the use of public resources and the quality of service delivery. In this sense, the risk register is closely connected with the broader understanding of risk management as a structured process that supports decision-making, accountability and the achievement of organisational objectives [8][5].

In an effective risk management system, the risk register links institutional objectives with specific risks, existing controls, planned mitigation measures, deadlines, responsible persons and the status of implementation[7]. In this way, it enables management to identify which risks are most significant, where controls are insufficient, which measures should be prioritised and whether the remaining level of risk is acceptable. This is particularly important because risk management should not be reduced to the identification of risks alone, but should include assessment, treatment, monitoring and review as continuous phases of the management process [8]. Therefore, the risk register should be understood as a managerial tool, not merely as a reporting template or administrative obligation.

The importance of a risk register lies in its ability to support proactive management. By identifying and assessing risks at an early stage, public sector institutions can anticipate potential weaknesses, allocate resources more efficiently and take preventive or corrective measures before problems escalate. This is particularly important in the public sector, where risks may affect legality, budget execution, procurement, service delivery, public trust and institutional accountability. INTOSAI [7] emphasises that internal control systems in the public sector should provide reasonable assurance that public resources are used economically, efficiently, effectively and in accordance with regulations. In that context, a well-maintained risk register strengthens transparency because it creates a documented trail of identified risks, planned responses and the progress of implementation.

For the risk register to be effective, it must be regularly updated and integrated into planning, monitoring and reporting processes. A register that is prepared once and not subsequently reviewed has limited practical value. Its usefulness depends on whether risk owners are clearly assigned, whether mitigation measures are realistic, whether deadlines are monitored and whether changes in risk exposure are recorded. Literature on risk registers also emphasises that they should be iterative, flexible and adapted to new information, changing circumstances and organisational priorities [10]. In this sense, the quality of the risk register is directly linked to the process maturity of the risk management system.

In addition, a risk register should be fit for purpose, meaning that its structure, methodology and criteria should correspond to the objectives of the institution, the nature of its processes, management needs and the regulatory environment in which it operates.

The development of risk registers [10] should be guided by several important principles, including purposefulness, flexibility, systems-level understanding, transparency, consistency, repeatability and interoperability. Although these principles are discussed in the context of public health emergency management[12], they are also relevant for public sector risk management more broadly, because they show that a risk register should support evidence-based, comparable and auditable decision-making[4].

The register should also enable a clear distinction between inherent and residual risk. Inherent risk refers to the level of exposure before controls are applied, while residual risk represents the level of exposure that remains after existing controls and planned mitigation measures have been taken into account. This distinction is essential because it allows management to assess whether controls are effective and whether the remaining risk is acceptable. Within internal auditing and risk-based control[19], risk registers may be used as evidence of risk identification, assessment and management decisions, while the relationship between inherent risk, controls and residual risk provides a practical basis for evaluating the effectiveness of the control system.

In the context of this paper, the risk register is particularly relevant for distinguishing between formal and process maturity. Formal maturity is reflected in the existence of a prescribed register, standardised templates and methodological guidelines. Process maturity, however, is reflected in the actual use of the register for decision-making, prioritisation of controls, monitoring of mitigation measures and assessment of residual risk. Therefore, the existence of a risk register is only the starting point; its real value depends on whether it functions as an active instrument of managerial accountability and effective public governance.

4. COMPARATIVE RESEARCH CONTEXT: FORMAL AND PROCESS MATURITY IN SERBIA AND CROATIA

This section presents the comparative research context for analysing risk management maturity in the public sectors of Serbia and Croatia. The two cases are regionally and institutionally comparable, as both systems have developed within the broader framework of public internal financial control, financial management and control, internal audit, and managerial accountability. At the same time, the publicly available documents show different approaches to reporting and monitoring the development of risk management.

Serbia provides more direct indicators of formal maturity, such as the adoption of risk management strategies, preparation of risk registers and use of risk management guidelines. Croatia, on the other hand, provides stronger insight into process maturity through the fiscal responsibility framework, self-assessment mechanisms, identification of weaknesses, internal audit opinions and the ongoing transition toward integrated risk management.

4.1. Serbia: Formal Indicators of Risk Management Maturity

In the case of Serbia, the available official documentation provides relatively clear quantitative indicators of the formal establishment of risk management in the public sector. The Consolidated Annual Report [15]on the State of Public Internal Financial Control in the Public Sector of the Republic of Serbia for 2024 is based on the annual reports submitted by public funds users and provides data on the development of financial management and control, internal audit and related risk management instruments.

A significant basis for assessing the state of the system is the number of submitted financial management and control reports. For 2024, a total of 4,890 [15] public funds users submitted reports, which represents a broad reporting base for analysing the formal development of internal control and risk management mechanisms in the Serbian public sector. The report [15] also notes that the most important public sector institutions submitted their reports, which increases the relevance of the findings for assessing the overall state of the system.

The key formal indicators of risk management maturity in Serbia are the adoption of risk management strategies, the preparation of risk registers and the use of risk management guidelines. According to the 2024 report[15], 71.34% of all public funds users adopted a risk management strategy, while 58.27% prepared a risk register. The difference between these two indicators suggests that the strategic framework of risk management is more developed than its operational documentation. In other words, a larger number of institutions have adopted a formal strategic document, while a smaller number have translated that framework into a structured register that enables the systematic recording, assessment and monitoring of risks.

The data also show relatively balanced results between the central and local levels. At the central level[15], 71.12% of public funds users adopted a risk management strategy and 56.81% prepared a risk register. At the local level, the corresponding figures are[15] 71.61% for risk management strategies and 59.76% for risk registers. These results indicate that there is no substantial difference between the two levels in terms of formal maturity, although the local level shows slightly better results in the preparation of risk registers.

More significant differences are visible when individual categories of public funds users are analysed. Organisations of compulsory social insurance show the highest level of formal maturity[15], with 100% of organisations having both a risk management strategy and a risk register. Ministries with administrative bodies within their structure also show relatively high results[15]: 85.71% have adopted a risk management strategy and 81.63% have prepared a risk register. These findings indicate that key central-level institutions have made greater progress in formally establishing risk management instruments.

At the same time, the results are weaker in some other categories. Enterprises owned by the Republic of Serbia recorded [15] 63.83% for the adoption of risk management strategies and 62.77% for the preparation of risk registers. Although these two indicators are relatively balanced, they suggest that further strengthening of formal risk management tools is still needed in this segment of the public sector. At the local level, direct budget users achieved relatively high results, with 89.25% having adopted a risk management strategy and 77.42% having prepared a risk register[15].

The development trend is also relevant for assessing formal maturity. In the period 2023–2024, the largest progress among all public funds users was recorded in the adoption of risk management strategies[15], with an increase of 8.75%, and in the preparation of risk registers, with an increase of 9.86%. Among priority public funds users, the increase was 9.30% [15]for risk management strategies and 10.00% for risk registers[15]. This indicates that risk management tools are becoming more widely institutionalised, particularly among categories considered especially important for the functioning of the public sector.

However, formal progress does not necessarily imply full process maturity. The Serbian report[15] explicitly states that the risk assessment component remains weak and that risk documentation, including risk management strategies and risk registers, is still not at a satisfactory level. It also notes that control activities for risk mitigation, responsibilities for their implementation, as well as monitoring and updating, remain insufficiently developed. At the same time, the use of methodological support is relatively widespread, as 67.22%[15] of public funds users use the Risk Management Guidelines when establishing and developing internal control systems[16].

Therefore, Serbia provides a useful example of a system in which formal indicators of risk management maturity can be clearly identified and measured. The available data show a relatively advanced level of formal establishment, particularly in terms of adopted strategies and risk registers, but also point to the need for further development of process maturity. The main challenge is not only to increase the number of institutions with formal risk management documents, but to ensure that these documents are actively used for risk assessment, mitigation planning, monitoring, updating and managerial decision-making.

4.2. Croatia: Process Indicators and Integrated Risk Management Development

In the case of Croatia, the available public documents provide a different type of evidence compared with Serbia. While the Serbian report contains direct quantitative indicators on the adoption of risk management strategies, the preparation of risk registers and the use of risk management guidelines, the Croatian documentation is more strongly oriented towards the assessment of internal control weaknesses, fiscal responsibility, internal audit opinions and the gradual development of integrated risk management. Therefore, Croatia is particularly relevant for analysing process indicators of risk management maturity.

The draft Consolidated Annual Report on the System of Internal Controls in the Public Sector of the Republic of Croatia for 2024 [13] was prepared on the basis of all 610 submitted Statements of Fiscal Responsibility, together with the accompanying documentation. This documentation included the Fiscal Responsibility Questionnaire, Plans for Eliminating Weaknesses and Irregularities, Reports on Eliminated Weaknesses and Irregularities from the previous year, and Internal Audit Opinions on the system of internal controls in areas audited during the previous year[13]. In addition, reports of the State Audit Office were analysed, as they contain information on weaknesses in internal controls related to budgetary processes and provide orders and recommendations for improvement.

The data show that, out of 610 submitted Statements of Fiscal Responsibility for 2024, 72 statements, or 12%, were submitted as Statement 1a, while 538 statements, or 88%, were submitted as Statement 1b [13]. Compared with 2023, when 55 users submitted Statement 1a, the number increased to 72 in 2024[13]. This indicates a certain improvement in the self-assessed state of internal controls, although the predominance of Statement 1b shows that weaknesses remain present in a large part of the system[13].

A more detailed insight into process maturity is provided by the reasons for submitting Statement 1b. In 2024, 531 users based Statement 1b on weaknesses in the internal control system identified through self-assessment in the Fiscal Responsibility Questionnaire[13]. In addition, 142 users referred to unimplemented orders and recommendations of the State Audit Office, while six users referred to other available information on institutional operations, including investigations related to suspected irregularities of a corruptive nature[13]. The document also emphasises [13] that Internal Audit Opinions must be taken into account when answering the Questionnaire, and that if internal audit findings or recommendations affecting a particular answer have not been implemented, the user cannot provide a positive answer without prior agreement with internal audit.

The Fiscal Responsibility Questionnaire functions as an important process indicator because it tests the functioning of internal controls in key budgetary processes, including budget and financial planning, budget execution, public procurement, accounting, reporting, transparency and asset management. The analysis [13] for 2024 shows a positive trend, as weaknesses and irregularities decreased in all questionnaire areas compared with 2023. Nevertheless, the largest number of weaknesses was still recorded in asset management, where 433 users identified weaknesses in 2024[13], compared with 463 in 2023[13]. Weaknesses in budget or financial plan execution were identified by 408 users, compared with 430 in 2023, while accounting weaknesses were identified by 295 users, compared with 337 in the previous year[13].

Other areas also show improvement, although weaknesses remain visible. In 2024, 144 users identified weaknesses in reporting and other areas, compared with 165 in 2023[13]; 92 users identified weaknesses in public procurement, compared with 106 in 2023[13]; 87 users identified weaknesses in budget or financial planning, compared with 109 in 2023[13]; and 40 users identified weaknesses in transparency, compared with 50 in 2023[13]. These indicators are not direct measurements of risk registers or risk strategies, but they provide a useful picture of risk areas within the internal control system.

The Croatian data also point to recurring structural weaknesses. The most significant weaknesses identified through self-assessment at the level of counties, cities and municipalities relate to asset management, budget execution and accountin. The document [13] notes that weaknesses in asset management have been eliminated slowly over a six-year period, partly because of the complexity of the area, the involvement of many stakeholders and external institutions, and the financial resources required for resolving property-related issues. This indicates that process maturity depends not only on the identification of weaknesses, but also on the capacity to implement corrective measures over time.

A particularly important feature of the Croatian case is the transition towards integrated risk management. A horizontal audit of the risk management process was conducted in four ministries[13]: the Ministry of Finance, the Ministry of Regional Development and EU Funds, the Ministry of Justice, Public Administration and Digital Transformation, and the Ministry of Health. The purpose of this audit was, among other things, to determine the extent to which risk management is an integral part of management and decision-making processes[13]. This is highly relevant for assessing process maturity, because it shifts the focus from the mere existence of formal instruments towards their actual use in governance and decision-making.

The same document states that the purpose of the horizontal audit was to collect information that would be used to amend the relevant legal framework governing the form and procedures of risk management in strategic planning and managerial decision-making[14]. Furthermore, amendments to the Act on the System of Internal Controls in the Public Sector introduced the obligation to establish integrated risk management for all entities covered by the Act[14], while the Ministry of Finance became responsible for preparing guidelines for integrated risk management.

Therefore, Croatia may be understood as a case in which risk management maturity is primarily visible through process-oriented mechanisms: self-assessment, identification of weaknesses, monitoring of corrective measures, internal audit opinions, quality assurance activities and the development of integrated risk management. Unlike Serbia, where formal indicators such as risk strategies and risk registers are directly measurable, Croatia provides stronger evidence of how internal control weaknesses are identified, reported and linked to further institutional development. This makes the Croatian case particularly important for analysing the transition from formal compliance towards process integration of risk management into planning, control and managerial decision-making.

4.3. Comparative Relevance of the Two Cases

The comparative relevance of Serbia and Croatia lies in the fact that both countries have developed public internal financial control systems within a broadly similar regional and administrative context, while their publicly available documents present different types of evidence on risk management maturity. This makes the two cases suitable for analysing the relationship between formal and process maturity in public sector risk management.

Serbia is particularly relevant as a case of formal maturity because its Consolidated Annual Report[15] provides direct quantitative indicators on the establishment of risk management instruments. The available data show the percentage of public funds users that have adopted risk management strategies, prepared risk registers and used risk management guidelines. These indicators make it possible to assess the extent to which risk management has been formally institutionalised within the public sector.

Croatia, on the other hand, is relevant as a case of process maturity because its available documentation[13] places stronger emphasis on fiscal responsibility, self-assessment, internal control weaknesses, internal audit opinions and corrective measures. Although the Croatian documents do not provide the same direct indicators on risk strategies and risk registers, they offer insight into how weaknesses are identified, monitored and linked to institutional improvement[13][14]. In addition, the ongoing transition towards integrated risk management shows that the Croatian system is moving from a compliance-based model towards a more process-oriented approach.

The comparison is therefore not based on identical indicators, but on complementary dimensions of maturity. Serbia provides clearer evidence of formal establishment, while Croatia provides stronger evidence of process-oriented monitoring and development. This distinction is important because a mature risk management system requires both dimensions. Formal instruments, such as strategies, guidelines[14][16] and registers, are necessary for standardisation and accountability, but they are not sufficient if they are not used in planning, decision-making, monitoring and corrective action.

From a methodological perspective, the comparison also highlights the limitations of relying only on quantitative indicators. A high percentage of adopted strategies or prepared registers may indicate progress, but it does not necessarily prove that risks are actively managed. Conversely, the absence of direct quantitative indicators on registers does not mean that risk management is underdeveloped, if the system contains strong mechanisms for self-assessment, audit follow-up, identification of weaknesses and continuous improvement.

For this reason, the Serbian and Croatian cases together provide a useful basis for examining risk management maturity as a multidimensional concept. The Serbian case shows the importance of formal institutionalisation, while the Croatian case illustrates the importance of embedding risk management into broader governance, fiscal responsibility and internal control processes. Their comparison supports the central argument of this paper: effective risk management in the public sector depends not only on the existence of formal documents, but also on their actual use as tools for managerial accountability, prioritisation of controls, monitoring of measures and improvement of public governance.

5. CONCLUSION

This paper analysed risk management in the public sectors of Serbia and Croatia through the distinction between formal and process maturity. The starting assumption was that the existence of formal instruments, such as strategies, guidelines, risk registers and reporting templates, is necessary but not sufficient for effective risk management. A mature system also requires that these instruments are actively used in planning, decision-making, monitoring of weaknesses, implementation of corrective measures and assessment of residual risk.

The Serbian case shows a relatively developed level of formal maturity. The available data [15] provide direct quantitative indicators on the adoption of risk management strategies, the preparation of risk registers and the use of risk management guidelines. These indicators make it possible to assess the extent to which risk management has been formally institutionalised in the public sector. However, the same findings also suggest that formal establishment does not automatically ensure process maturity. The difference between the percentage of institutions that adopted risk management strategies and those that prepared risk registers indicates that the strategic framework is more developed than operational documentation and systematic monitoring[15].

The Croatian case provides a different type of evidence. Instead of direct indicators on strategies and registers, the available documents [13] emphasise fiscal responsibility, self-assessment, internal control weaknesses, internal audit opinions, corrective measures and the transition towards integrated risk management. This makes Croatia particularly relevant for analysing process maturity. The Croatian system shows how weaknesses in internal controls are identified, documented and linked to further institutional improvement. At the same time, the introduction of integrated risk management indicates a shift from a compliance-based approach towards a broader model in which risks should be connected with strategic planning, managerial decision-making and continuous improvement[13].

The comparison of the two cases shows that risk management maturity cannot be measured through one type of indicator only. Serbia provides stronger evidence of formal institutionalisation, while Croatia provides stronger insight into process-oriented mechanisms. These two dimensions are complementary. Formal maturity ensures standardisation, comparability and accountability, while process maturity shows whether risk management is actually embedded in governance practices and used as a tool for improving institutional performance.

The analysis also confirms the importance of the risk register as a central instrument of risk management. However, the value of a risk register depends on its practical use. If it is prepared only to satisfy formal reporting requirements, its contribution to management remains limited. If, however, it links objectives, risks, controls, mitigation measures, responsible persons, deadlines, implementation status and residual risk, it becomes an active tool of managerial accountability. In this sense, the assessment of residual risk is particularly important, because it shows whether existing controls and planned measures have actually reduced the level of exposure to an acceptable level.

The main conclusion of the paper is that effective risk management in the public sector requires the integration of formal and process maturity. Public institutions need formal frameworks, but they also need mechanisms that ensure regular updating, monitoring, responsibility, audit follow-up and the use of risk information in decision-making. Without this connection, risk management may remain an administrative exercise[17]. With it, risk management can become a practical instrument for strengthening internal controls, improving the use of public resources, supporting accountability and enhancing the quality of public governance.

Future development of risk management in both systems should therefore focus not only on increasing the number of institutions with formal risk management documents, but also on improving the quality of their use. Particular attention should be given to the standardisation of risk registers, clearer assessment of inherent and residual risk, stronger monitoring of mitigation measures, better integration with internal audit findings and the use of risk information in strategic and operational decision-making. This would contribute to transforming risk management from a formal obligation into an effective mechanism of public sector governance.

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УПРАВЉАЊЕ РИЗИЦИМА У ЈАВНОМ СЕКТОРУ СРБИЈЕ И ХРВАТСКЕ: КОМПАРАТИВНА АНАЛИЗА ФОРМАЛНЕ И ПРОЦЕСНЕ ЗРЕЛОСТИ

Резиме: *Управљање ризицима у јавном сектору Србије и Хрватске испитује се кроз разликовање формалног успостављања инструмената управљања ризицима и њихове процесне зрелости у практичној примени. Полази се од становишта да постојање стратегија, смерница, регистара ризика и извештајних образаца представља значајан, али не и довољан предуслов за делотворно управљање ризицима. Стварна зрелост система огледа се у мери у којој се наведени инструменти користе у процесима планирања, доношења одлука, праћења уочених слабости, спровођења корективних мера и процене преосталог, односно резидуалног ризика. Циљ истраживања је да се упореде доступни показатељи развијености управљања ризицима у јавном сектору Србије и Хрватске, са посебним нагласком на разлику између формално успостављених инструмената и њихове стварне процесне употребљивости. Методолошки приступ заснива се на компаративној анализи званичних извештаја, смерница и јавно доступних докумената релевантних за област финансијског управљања, унутрашњих контрола и управљања ризицима. У случају Србије анализирају се непосредни квантитативни показатељи, као што су усвајање стратегија управљања ризицима, израда регистара ризика и примена смерница. У случају Хрватске, предмет анализе чине процесни показатељи, укључујући Изјаву о фискалној одговорности, Упитник о фискалној одговорности, идентификоване слабости система унутрашњих контрола, мишљења унутрашње ревизије и активности усмерене ка интегрисаном управљању ризицима. Очекивани допринос рада огледа се у продубљивању разумевања односа између формалне институционализације и практичне примене управљања ризицима као инструмента управљачке одговорности, рационалнијег коришћења јавних ресурса и унапређења квалитета јавног управљања.*

Кључне речи: *управљање ризицима; јавни сектор; регистар ризика; резидуални ризик; унутрашње контроле; формална зрелост; процесна зрелос*

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INDIVIDUALS ARRESTED FOR PROPERTY CRIMES: FROM SUSPICION AND INDICTMENT TO JUDGMENT AND IMPRISONMENT IN SERBIA

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Abstract: *This study presents findings derived from a synthesis of theoretical and empirical insights into crime and the efficacy of criminal policy in Serbia. It explores theoretical approaches to the conceptualization of "crime", a term universally recognized yet theoretically ambiguous regarding its generic boundaries and scientific definition. The study provides an analysis of the theory of crime alongside an empirical evaluation of data firmly grounded in research. The paper serves as a convergence of two distinct perspectives on the same research subject: crime and the institutional reaction to it. It integrates global theoretical research with empirical findings in Serbia, tracing the procedural trajectory from arrest and suspicion, through indictment and judgment, to imprisonment for property crimes. The synthesis of these variables provides a comprehensive representation of the complex interactions between criminal activity and law enforcement efforts.*

Keywords: *arrested individuals, property crime, suspects, defendants, judgment, prison, Serbia*

1. INTRODUCTION

In common perception, criminal law is often synonymous with the concepts of a criminal offense, the perpetrator, the victim, and the pursuit of justice. This paper follows this line of inquiry, attempting to establish a correlation of effectiveness by analyzing indicators from official records of committed crimes. By correlating police reports (criminal charges), prosecutorial indictments, and court judgments, the study aims to demonstrate the relationship between public perception and institutional reality. The research investigates the correlation between these legal concepts through the empirical data on suspects, defendants, and convicted persons for property crimes, as defined in Chapter 21 of the Criminal Code of the Republic of Serbia, spanning the period from 2014 to 2024 [1].

2. METHODOLOGY AND MATERIALS

The methodological approach and research materials integrate scientific and empirical findings related to the subject of the study: the arrest, suspicion, indictment, and conviction of persons for criminal offenses in the field of property crime on the territory of Serbia. To conduct the formulation of a new conclusion from the obtained set of theoretical-empirical stances from the research conducted through the application of scientific methods and instruments, which emerge from the topic of the paper, the methodological framework has three pillars of support for its results. The first point of support is material of a theoretical-scientific character regarding crime. The second point of support is theoretical material created by researching existing laws in Serbia in the fields of detection, arrest, indictment, sentencing, and prison sentences for criminal offenses of property crime. The third point of support is empirical material from existing records in which data are stored on the number of filed criminal reports, indictments, sentences, and persons convicted to prison sentences for property offenses in Serbia.

Proceeding from indicators, statements in the form of written norms, in the description and scientific explanation of the subject of research in this paper, the basic analytical and synthetic methods of cognition and research, such as analysis, synthesis, classification, concretization, generalization, and the inductive-deductive method, were applied. From the corpus of general scientific methods, the historical, hypothetical-deductive, and statistical methods were applied. From the group of methods for data collection, the method of document content analysis was used, primarily its technique of qualitative document content analysis, with statistical analysis. Besides the context unit, the analysis employed the counting (treatment) unit and the classification unit, through which the document contents were coded and classified into the basic analytical categories. This enabled an assessment of the causal and functional relationships among filed criminal reports for property crimes, the establishment of suspicion based on those reports, the filing of indictments, and the imposition of prison sentences through final court judgments [2, p. 58; 3, pp. 18-19].

3. CONCEPTUAL AND CATEGORICAL FRAMEWORK

The conceptual and categorical framework of the research is based on the fundamental legal concepts and procedural institutions defined in the provisions of the Code of Criminal Procedure, Article 2, Paragraph 1, Items 1, 2, 3, 4, where the legislator provides definitions of the following institutes: “a suspect is a person against whom, due to the existence of grounds for suspicion that they have committed a criminal offense, a competent state authority in pre-investigative proceedings has undertaken an action prescribed by this Code and a person against whom an investigation is being conducted; a defendant is a person against whom an indictment has been filed that has not yet been confirmed, or against whom an abbreviated indictment, a private lawsuit, or a proposal for the imposition of a security measure of mandatory psychiatric treatment has been submitted, and the main trial or hearing for the imposition of a criminal sanction has not yet been scheduled, or rather, a term that serves as a general name for a suspect, defendant, accused, and convicted person; the accused is a person against whom an indictment has been confirmed and a person for whom, regarding an abbreviated indictment, private lawsuit, or proposal for the imposition of a security measure of mandatory psychiatric treatment, a main trial or hearing for the imposition of a criminal sanction in summary criminal proceedings has been scheduled; a convicted person is a person for whom it has been determined by a final court decision that they are the perpetrator of a criminal offense or an unlawful act defined in the law as a criminal offense, unless, based on the provisions of the Criminal Code, they are considered unconvicted” [4].

In Article 2, Item 23, the Legislator prescribes that deprivation of liberty implies:

arrest... which, in accordance with this Code, is included in detention [4]. In the Law on Police, Article 30, Paragraph 3, Item 4, it is prescribed that police duties are.... the arrest of perpetrators of criminal offenses... [5]. According to the provisions of the Law on the Execution of Criminal Sanctions, "a person serving a prison sentence (convict) is a person to whom a final court judgment has imposed a criminal sanction of deprivation of liberty, which they serve in a penal-correctional institution" [6]. One of the elements of the categorical apparatus in the research—the subject of the research—is also the prison, which can be defined by saying that it is an institution for the execution of criminal sanctions or a place where court judgments are implemented, (including prison sentences, house arrest, and alternative sanctions, and in accordance with legal norms that define the rights of the convicted)—that is, the execution of criminal sanctions represents the implementation of court judgments in practice [6].

Defining the concept of a prison based on existing theoretical approaches presents certain challenges, as the literature offers numerous and often differing perspectives on its definition, from the idea that a prison is many things, to the idea that a prison is a building, and being in prison is a state of captivity, confinement, and deprivation [7, p. 3; 8, p. 49]. For the famous writer Michel Foucault, "prison is an idea—an exhaustive disciplinary apparatus" [9, p. 42; 10, p. 1137]. For the author Ruth Wilson Gilmore, "prison is a partial geographical solution to political-economic crises, organized by the state, which is itself in crisis" [11, p. 26; 10, p. 1138]. Prison is an institution that, as Angela Davis describes, "has a warehouse of ideas and practices" [12, p. 49; 10, p. 1139]. This includes acting as the "last social service" [13, p. 574; 10, p. 1140] and a place of punishment [14, p. 42; 10, p. 1141]. One of the writers, poet and lawyer Dwayne Betts, writes about prison in the following way: "Most importantly, for those who are and were incarcerated, prison can be much more: Prison is the sinner's bouquet, the house of the torn and the tattered" [15, p. 26; 11, 10, p. 1138].

4. RESEARCH RESULTS

4.1. The Concept of Crime in Theory

Within the existing body of theoretical literature on crime, Julian Roberts and Loretta Stalans argue that: "dealing with one of the most popular questions of today—crime and the way we interpret it—reveal a disparity between public perception of crime and the reality of crime statistics" [16, p. 160]. There is no doubt, as Louri finds, "that crime and punishment are certainly contested topics" [17, p. 134]. It appears to the public, as authors Julian Roberts and Loretta Stalans observe, "that crime is everywhere, from boardrooms to the nation's bedrooms, in people's homes and on their television screens" [16, p. 2].

Some authors in the theory of crime believe "that crime is primarily approached as a normal and socialized risk and as a technical problem" [18, p. 4]. Renowned authors Feeley and Simon believe "that the criminal offense is stripped of its moral connotations, in a view close to Durkheim's perspective on crime, where crime is an inevitable and accepted phenomenon. Delinquency is viewed as a normal risk, of the same kind as other risks covered by social insurance, such as illness or unemployment" [19, p. 178]. This "normality" finds its source in the conception of "crime-as-accident," where crime is a risk whose occurrence must be as predictable as possible and whose negative impacts must be minimized [18, p. 5].

Traditionally, researchers such as Simon and Feeley, who analyzed the causes of crime, "insisted on either its voluntary or its structural character" [20, p. 76]. To act upon crime, the former sought to modify the factors influencing the individual calculus of the perpetrator, while other researchers believed that, since the causes of crime could be found outside the criminal process, it is precisely these external causes that must be addressed.

According to Simon and Feeley, the "new penology" functions outside these two traditional understandings. In the new penology, "crime is not approached structurally, as it focuses on the committed act without reference to external context; nor is it approached voluntarily, as it does not deal with individual behavior but rather with the management of groups" [21, p. 338]. From the aforementioned, it can be concluded that crime "is considered less of an individual or social problem and more of a technical problem whose effects are more important than its causes. Crime is understood as a 'statistical probability' rather than an illicit punishable act, while simultaneously, the goal of the penal process is not to respond to individual deviance or social problems, but to regulate levels of deviance, to minimize the occurrence and negative consequences of crime, and thereby make crime tolerable through systemic management" [22, p. 452]. As stated above, the new penology presents crime as a normal risk whose occurrence must be predicted and its negative impacts reduced to a minimum [23, p. 842].

In their research, authors find that "theories of crime can be divided into those that attempt to explain the development of criminal offenders and those that attempt to explain the development of criminal events. Theories and research on offenders have dominated the development of criminology" [8, p. 5; 24, p. 476]. On the other hand, currently present knowledge in the literature shows that "most research on crime and crime prevention is focused on why certain types of people commit crime and what we can do about them" [25, p. 231]. It is only recently that "serious attention has begun to be paid to explaining the crime, rather than the criminality of the people involved in crime" [26, p. 98].

A number of authors, such as Weisburd, Maher, Sherman, Buerger, Cohn, and Petrosino, hold the view that, "although theories of crime are often viewed as competing explanations for the crime problem, we consider it useful to start with the idea that explanations of offenders and events are complementary, rather than competing" [27, p. 52].

It is pointed out in theory "that, even if we had a good explanation for the development of offenders, we would still need a good explanation for criminal events" [28, p. 366]. Specifically, "we would want a theory that could tell us why offenders choose certain targets—why some targets are attractive and others repulsive" [8, p. 4]. However, "to date, theories on the development of crime do not provide a firm basis for such predictions, and there is little consensus on what such a theory would look like in the future" [29, p. 8].

Before presenting the empirical findings, let us present two approaches which we consider to most vividly reflect the concept of crime theoretically. One approach is based on the premise that crime constitutes a public wrong [30, p. 162], while the second approach proceeds from the premise that crime is a special type of legal wrong [17, p. 139].

4.2. Property Crime: The Concept in Theory

One of the primary questions to resolve is the definition of property, given that the subject of this research is property crime. We will address this first through the available literature and subsequently through the legislative acts of Serbia, as the empirical research is conducted within its territory. To consider the concept of property, we will draw upon the perspectives of authors such as Bell and Parchomovsky, who state in their work *A Theory of Property* that: "...despite its importance, the law of property has evaded both a consistent definition and a unified conceptual framework. Indeed, modern property scholarship has completely fragmented the field. On one hand, instrumentalists view property as nothing more than default contractual rules. On the other, conceptualists proclaim the primacy of *in rem* rights and specifically privileged rights such as the rights to exclude, use, and transfer. Other legal scholars view property as a 'bundle of sticks' capable of taking any form" [31, p. 531]. These authors propose "a unified theory of property based on the insight that property law is organized around the creation and defense of the value inherent in stable ownership, indicating that the value of stable ownership renders coherent the disjointed theories that currently plague property scholarship and provides useful conceptual, descriptive, and normative implications" [31, p. 536]. They further state that "any coherent and comprehensive theory of property must focus on four legal questions: (1) What things are protected by property law; (2) against whom; (3) with what rights; and (4) by what enforcement mechanism, focusing on the value inherent in stable ownership and demonstrating how property law recognizes and helps create stable relationships between persons and assets, thereby enabling owners to extract utility that would otherwise be unavailable to them" [31, p. 538]. In concluding their findings, Bell and Parchomovsky find "that in addition to theoretical coherence, their approach provides conceptual simplicity and clarity by rendering the 'bundle of sticks' metaphor obsolete, replacing it with the view that property rights are a means of defending the value of stable ownership in the interest of the asset. Furthermore, they note that their value-oriented approach possesses both descriptive and normative power" [31, p. 582].

If one consults the Federal Bureau of Investigation's Uniform Crime Reporting (UCR) program, "property crime includes multiple offenses protecting property, from thefts and burglaries to other forms of criminal activities that attack, seize, damage, or endanger property, with the following elements: unlawful taking of property, unlawful entry into a structure to commit a crime, any intentional or malicious burning or attempt to burn property. These property offenses are characterized by the unlawful taking of movable property without the use of force or threats of force against the victim [32].

According to our local author, Professor Ignjatović, in his 2007 book *Criminology*, "property criminality includes all those acts directed against property in which the perpetrator seeks through the act to obtain a benefit for themselves or another, or to cause damage to someone" [33, p. 150]. Authors Vesna Nikolić-Ristanović and Slobodanka Konstantinović-Vilić, state in their textbook *Criminology*, that "property criminality generally refers to criminal acts directed toward the unlawful appropriation or damaging of another's object or right, or the acquisition of unlawful property benefit in another manner" [34, p. 165]. The same authors, Vesna Nikolić-Ristanović and Slobodanka Konstantinović-Vilić, also note that "thus, in most countries, the concept of property criminality encompasses: various types of theft, including burglary and other types of aggravated theft, as well as the theft of vehicles and items from vehicles, embezzlement, fraud, damage to another's property, extortion, unauthorized use of another's vehicle, and blackmail" [34, ibid, 165].

Based on the aforementioned, it can be concluded that property crime is a category of criminal activity directed against the property rights of individuals. It can be divided into what is theoretically termed "classic" property crime, referring to the appropriation of another's object or property without the use of violence, where the injured party has no contact with the perpetrator during the criminal event—thereby lacking the elements that would transform the act, such as simple theft, into what is called privileged or aggravated criminality (for example, transitioning into aggravated theft or other forms). One classification can be based on whether physical force was used to take the object or property from a person or to retain an object or property already taken. Alternatively, another classification of property crime finds its basis in the actions of the perpetrator who engages in a criminal contact that is unrecognized by the victim; here, without the use of force, the perpetrator uses speech to create a state (through various methods) that leads the person holding or owning the property to a decision to hand it over to the perpetrator, without the knowledge that at the moment of handover, a criminal offense has been committed to their detriment.

4.3. Empirical Findings

The following data summarizes the research findings for the period 2014–2024.

Table 1: Annual Overview of Property Crime Statistics

Year	Suspects	Indicted	Convicted
2014	50,303	13,868	1,236
2015	58,741	13,299	11,301
2016	44,000	13,017	11,302
2017	40,443	11,846	10,307
2018	40,595	10,050	8,807
2019	38,713	8,879	7,877
2020	29,788	7,440	6,519
2021	34,761	7,705	6,708
2022	39,202	7,351	6,356
2023	33,474	7,173	6,231
2024	31,873	6,403	5,551
Total	**441,893**	**107,034**	**92,195**

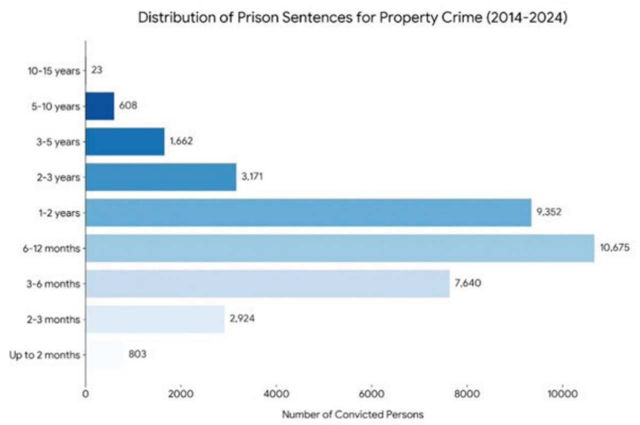
Procedural Stage	Total Number	Percentage (of Reported)
Reported Suspects	441,893	100%
Indicted / Formally Charged	107,034	24.2%
Convicted Persons	92,195	20.8%
Incarceration (Prison Sentences)	36,858	8.3%

Research Sample: Overview of the relationship between suspects, indictments, and convictions for property crime by year in Serbia (2014–2024)

Table 2: Ratio of Property Crime to Total Crime (2014-2024)

Research Period 2014–2024	Suspects	Indicted	Convicted
	Total	Property	Total
Raw Figures	959,693	441,893	386,640
Share (%)	100%	46.04%	100%

Research Sample: Ratio of Property Crime Suspects, Indictments, and Convictions relative to Total Figures in Serbia (2014–2024)



Source: Created by the authors

Chart 1. Length of prison sentences for crimes against property

5. ANALYSIS AND DISCUSSION

As Professor Ignjatović states, "providing a typology of property criminality that respects criminological criteria represents a simple task only at first glance" [33, p. 150]. Based on the research findings presented in this paper, the following conclusions can be drawn.: those reported for committing criminal offenses in the field of property criminality constitute 46.04% of the total number of perpetrators in the investigated period within the territory of Serbia (959,653:441,893). The correlation between the number of persons reported for property crime and the number of persons indicted in Serbia reveals the following (441,893:107,034): a rate of 24.22%, which is not even one-third of the number of reported persons. Furthermore, the result obtained regarding the ratio of filed

Table 3. Distribution of Imprisonment Sentences for Property Crime by Duration

Research Period: 2014–2024	10-15 years	5–10 years	3–5 years	2–3 years	1–2 years	6–12 months	3–6 months	2–3 months	Up to 2 months
Total	23	608	1,662	3,171	9,352	10,675	7,640	2,924	803

Research Sample: Number of persons sentenced to imprisonment for property crime in Serbia, categorized by the length of the sentence (2014–2024)

Table 4: Summary of Procedural Outcomes

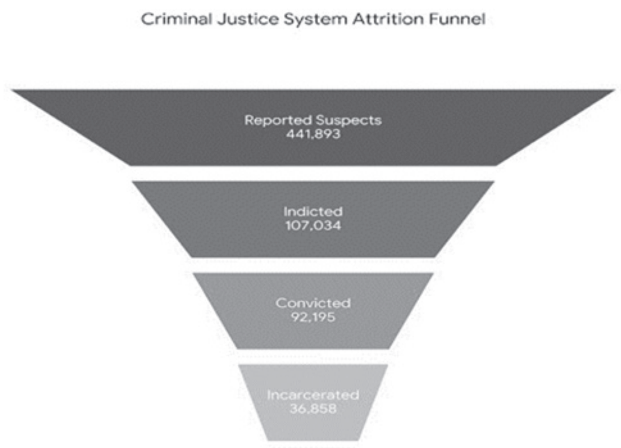
Research Period: 2014–2024	Suspects	Indictments	Convictions	Incarceration
Total	441,893	107,034	92,195	36,858

Research Sample: Ratio of Suspects, Indictments, Convictions, and Incarceration Sentences for Property Crime in Serbia (2014–2024) reports for property crimes to the number of indicted perpetrators yields a correlation of (441,893:92,195), or 20.86%, representing only one-fifth of convicted persons relative to the total number of reported perpetrators. Moreover, a further negative correlation in the research results indicates that the ratio between the number of indicted and the number of convicted persons (107,034:92,195) stands at 86.13%.

The results show another negative correlation: the ratio of people sentenced for property crimes to the number of those sentenced specifically to a prison term is in a correlation of (36,858:92,195), which constitutes 39.97%. According to the findings, it can be concluded that of the total number of persons reported for property crimes—correlation (36,858:441,893)—the number of those sentenced to prison constitutes 08.34%. From the findings, it can be concluded that the number of persons sentenced to prison for a duration of 10–15 years is 30; 608 persons were sentenced to prison for 5–10 years; and of the total number of those sentenced to prison for a duration of 3–5 years, 1,662 persons were sentenced. Among the total number of persons sentenced to imprisonment, the largest proportion consists of those sentenced to terms of 1–2 years, totaling 10,272 individuals, followed by persons sentenced to 6–12 months, totaling 10,033; the next place on the scale according to the number of prison sentences issued is held by individuals sentenced to a duration of 3–6 months, totaling 7,640; while those sentenced to a total prison term of 2–3 months equal 2,940 followed by those sentenced to a duration of up to 2 months, totaling 803 persons.

Of the number of persons sentenced to deprivation of liberty served in prison institutions, females were convicted for property crimes in 10,048 cases, constituting 27.26% of the total number of convicts. Significantly, the research findings indicate that, from 2017 onwards, females experienced a notable increase in their share of convictions for property crimes in each subsequent year. It is also significant that the research finding shows that out of the total number of convictions, in 5,378 cases, the sanction was imposed for an *attempted* property crime, which constitutes 14.59%. From the stated findings, the following quota of convicted persons can be derived: 92,195/100,000 = a quota of 92 convicted persons in the field of property crime. This also indicates the quota of persons sentenced to a prison term of deprivation of liberty: 36,858/1,000,000 = a quota of 36 in the field of property crime.

Significant to the research is the finding of “crime attrition” [33, p. 78], presented by Professor Ignjatović in his 2007 textbook *Criminology*, which, according to his view, “can be presented in the form of a funnel” [33, ibid, 78]:



Source: Created by the authors in 2026, based on research results from the following sources: ISSN-0354-3641; Bulletins 603, 617, 629, 643, 655, 665, 677, 689, 702, 714, 725. Tables 1, 2, 3, 4. [35].

Illustration No. 1. Data based on research regarding the attrition of property crime in the territory of Serbia for the period 2014–2024.

According to the findings derived from the research results, crime attrition in Serbia during the investigated period from 2014 to 2024 stands at a level of (441,893:92,195 = 79.15%) of the total number of persons reported for property crimes, which is an exceptionally high percentage-at the level of four-fifths. Of the total number of adult citizens (441,893:5,100,000), the number of reported perpetrators for property crimes constitutes 08.66% of the total number of adult citizens in Serbia, and of the total population of Serbia (441,893:6,586,476), it constitutes 06.70% of reported perpetrators.

6. CONCLUSION

The results obtained from the research material developed for this study raise concerns regarding the effectiveness of the criminal justice process. They indicate that certain factors within the procedures involving the police, prosecution, and courts prevent the conclusion that this process effectively contributes to the prevention of property crime. On the contrary, the findings provide a sufficient empirical basis for drawing the opposite conclusion: the participants within this process and the process itself function in a manner that generates property criminality within the territory of Serbia.

The relationship remains incomprehensible: while a significant portion of the total population in Serbia participates in the commission of property-related criminal offenses, this fact is not reflected in the state's criminal and social policies. If a comparative parameter is introduced at this point, it becomes evident that the total number of persons reported for committing criminal offenses within the overall crime structure in Serbia represents a significant share of the adult population (exceeding 8 percent). This further intensifies the concern, particularly given the absence of visible measures aimed at strengthening criminal policy responses. During the observed period, criminal records were opened for 959,653 individuals based on reports filed for criminal offenses within the overall crime statistics, representing approximately one-fifth of the population of Serbia. Specifically, regarding property crime, 441,893 individuals have a criminal record based on reports of having committed an offense in the field of property criminality—representing one-tenth (1/10) of the population—which is alarming.

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УХАПШЕНИ ЗА ИМОВИНСКИ КРИМИНАЛ - ОД ОСУМЊИЧЕЊА И ОПТУЖНИЦЕ ПРЕКО ПРЕСУДЕ ДО ЗАТВОРА У СРБИЈИ

Резиме: *Истраживање ће изложити налазе из синтезе и увида у теорију и емпирију криминала и успеха или неуспеха криминалне политике у Србији-овај рад то одражава. Он нуди приступе у теорији о поимању криминала, свима познатог термина, али ником тако теоријски јасан да би могао да га одреди и омеђи генерички, да дефиниција буде прихватљива за науку. Резултат ове студије је анализа теорије о појму криминал и емпиријска анализа резултата, која је чврсто утемељена у истраживању. Укратко, рад је стециште две вододелнице једног истог предмета истраживања: криминала и реакције на њега. Рад склапа теоријска истраживања у светском научном фонду знања о криминалу и емпиријске налазе у Србији од хапшења и осумњичења, преко оптужнице и пресуде до затвора за имовински криминал. Синтеза ових варијабли слика најбољу слику коју познајемо о сложеним начинима на које криминал и борбе против њега међусобно делују.*

Кључне речи: *ухапшени, имовински криминал, осумњичени, оптужени, пресуда, затвор, Србија*

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ON THE LEGAL PERMISSIBILLITY AND ECONOMIC JUSTIFICATION OF AMENDMENTS TO BANKS' GENERAL TERMS AND CONDITIONS THROUGH THE FICTION OF DECLARATION OF INTENT

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Abstract: *This paper examines the economic justification and legal permissibility of amendments to banks' general terms and conditions implemented through clauses based on the fiction of declaration of intent. First, the authors outline the key economic arguments supporting this method of modifying banks' general terms and conditions, emphasizing considerations of efficiency, cost reduction, and operational flexibility. The paper then provides an overview of the legal framework in Germany prior to the Postbank decision of the Federal Court of Justice, followed by an analysis of the new legal situation established after that ruling. Finally, instead of a traditional conclusion, the authors offer a critical reflection on the current legal position in Serbian law concerning the same issue.*

Keywords: *general terms and conditions, banks, consumers, clauses based on the fiction of declaration of intent, economic justification, legal permissibility*

1. INTRODUCTION

In banking practice, the use of clauses based on the fiction of declaration of intent as a mechanism for amending general terms and conditions has become widespread. Specifically, banks' general terms and conditions regularly contain clauses under which a proposal to amend the existing terms is deemed accepted unless the client explicitly rejects the proposed amendment within a specified period. The legal fiction of a declaration of intent enables contracting parties to relax the requirement of actual consensus when modifying a contract, allowing contractual amendments to rest on a fictitious consensus. In this context, the client's silence, contrary to the general rule that silence does not constitute acceptance, is treated as consent to the proposed amendment. Consequently, unlike the general rules of contract formation, under which the offeree must actively accept the offer in order for a contract to be concluded, clauses based on the fiction of declaration of intent reverse this logic: the offeree must take action in order to prevent the contract [1, p. 40], or, in the present case, to prevent the amendment of an already existing contractual relationship with the bank.

Legal scholarship has therefore not without reason described clauses based on the fiction of declaration of intent as a so-called "Trojan horse" within contractual arrangements [2, p. 1]. Clauses in banks' general terms and conditions that enable amendments through the fiction of declaration of intent are no less problematic than clauses granting banks an unrestricted right to unilaterally modify their general terms and conditions e.g., provisions stating that "the bank reserves the right to amend its general terms and conditions at any time and to notify the client accordingly [ibid, 6]." Such clauses are generally regarded as unfair and, as such, invalid. Although clauses based on the fiction of declaration of intent formally provide clients with the opportunity to oppose the proposed amendments, thereby suggesting a choice between the existing and the amended terms, this choice is largely illusory. In practice, if a client rejects the proposed amendments, banks will, as a rule, terminate the contractual relationship [ibid, 6-7].

Against this background, the paper examines whether amendments to banks' general terms and conditions effected through the legal fiction of a declaration of intent are legally permissible. The legal analysis is primarily based on German law, the case law of the German Federal Court of Justice, as well as the jurisprudence of the Court of Justice of the European Union. In addition, the paper addresses the question of the economic justification of such amendment mechanisms. Finally, instead of a conventional conclusion, the authors provide an overview of the relevant solutions adopted in Serbian law with regard to the same issue.

2. ECONOMIC JUSTIFICATION OF AMENDING BANKS' GENERAL TERMS AND CONDITIONS THROUGH FICTIONS OF DECLARATION OF INTENT

From an economic perspective, the use of clauses based on the fiction of declaration of intent for amending banks' general terms and conditions is highly justified, particularly in the context of mass transactions. Banking relationships are typically long-term, often lasting for decades, and are characterized by a large number of clients and standardized contractual frameworks. Requiring individual, explicit consent from each client for every contractual adjustment entails significant transaction costs, including administrative expenses, communication costs, delays, and legal uncertainty. These costs are ultimately transferred to consumers in the form of higher fees or reduced service quality. In this sense, fiction-of-consent mechanisms serve as an instrument of cost internalization and operational efficiency, enabling banks to adapt contractual terms to changing legal, regulatory, and economic conditions in a timely and economically sustainable manner [3, str. 48].

Moreover, fiction-of-consent clauses help to address collective action and rational apathy problems commonly observed in consumer behavior. In practice, a large proportion of bank clients are indifferent to minor contractual amendments or lack the incentives to actively respond to proposed changes, even when such changes are economically neutral or beneficial. Requiring explicit consent in such cases forces both parties into a suboptimal equilibrium, where the absence of response leads not to the continuation of the existing contractual framework, but to contractual paralysis. Fiction-of-consent clauses, by contrast, allow contracts to evolve while preserving the consumer's right to object and to terminate the contractual relationship. From a welfare-economic standpoint, such clauses can therefore be regarded as Pareto-efficient, provided that adequate safeguards against abuse are in place [4, str. 163].

Finally, the economic rationale for fiction-of-consent clauses is particularly strong in highly regulated sectors such as banking, where contractual amendments are often driven by exogenous regulatory changes rather than by opportunistic behavior on the part of banks. In such cases, the prohibition of fiction-of-consent mechanisms may produce system inefficiencies, including delayed compliance with regulatory requirements, increased operational risk, and fragmentation of contractual frameworks [5, str. 114]. A balanced legal approach should therefore aim not at the categorical exclusion of fiction-of-consent clauses, but at their targeted limitation and precise formulation, ensuring both economic efficiency and effective consumer protection [6, str. 13]. This perspective supports the view that the problem identified by the German Federal Court of Justice lies not in the economic logic of fiction-of-consent mechanisms as such, but in the excessive breadth and indeterminacy of the specific clause examined in the Postbank case.

3. THE SITUATION UNDER GERMAN LAW PRIOR TO 27 APRIL 2021

Given the specific characteristics of mass transactions, particularly in the banking sector, the German legislator did not impose a general prohibition on clauses based on the fiction of declaration of intent in general terms and conditions. Instead, their validity was made conditional upon compliance with certain substantive and formal requirements [7, p. 878]. The provision of the German Civil Code (hereinafter: GCC) relevant to such clauses is Section 308 No. 5. This provision stipulates that a clause in general terms and conditions is, in particular, invalid if it provides that a declaration by the contractual partner of the user of the general terms and conditions is deemed to have been made or not made depending on the performance or omission of a specific act, unless the contractual partner is granted an appropriate period for submitting an express declaration and the user of the general terms and conditions undertakes to specifically inform the contractual partner, at the beginning of that period, of the significance of their conduct [8, art. 308, num. 5].

Accordingly, the requirement to grant an appropriate period for submitting an express declaration is intended to place the contractual partner of the user of the general terms and conditions in a position to prevent the occurrence of the fiction of declaration of intent by expressing their actual will [1, p. 225-226]. At the same time, for a clause based on the fiction of declaration of intent to be valid, the user of the general terms and conditions is obliged to draw the contractual partner's attention to the fact that their silence cannot prevent the incorporation of the new general terms and conditions into the contract. This duty to inform must be expressly stipulated within the clause itself [7, p. 878]. Thus, the granting of an appropriate period for submitting an express declaration, together with the duty to inform imposed on the user of the general terms and conditions is intended for the purpose of protecting the contractual partner to ensure that the latter is aware of the legal significance of their conduct, is able to prepare for it, and is afforded sufficient time to decide how to act and, if necessary, to submit an express declaration. Ultimately, it may be concluded that a user of general terms and conditions who has a legitimate interest in the occurrence of legal effects through the fiction of declaration of intent must ensure that the contractual partner is able to prepare for those legal effects and is not taken by surprise by their occurrence. This objective is served precisely by granting an appropriate period for submitting an express declaration and by fulfilling the duty to inform [9, p. 1241].

Banking contracts with clients are, as a rule, concluded for an indefinite period and often last for many years, sometimes even decades. If, during the course of such a contractual relationship, the legal and/or economic framework conditions change, it becomes necessary to adjust the relevant general terms and conditions accordingly [10, p. 2]. For more than seventy years, specifically since the first unification of banks' general terms and conditions in 1937, German banks relied on clauses based on the fiction of declaration of intent more precisely, the fiction of consent as a mechanism for amending their general terms and conditions [11, p. 2].

This mechanism of amending banks' general terms and conditions also received statutory recognition with the implementation into German law of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market (hereinafter: the Payment Services Directive) [12], specifically in Section 675g GCC. According to this provision, which governs amendments to framework contracts for payment services, an amendment initiated by the payment service provider requires that the intended changes be offered to the payment service user no later than two months before the proposed date of their entry into force. The payment service provider and the payment service user may agree that the consent of the payment service user to the amendment of the framework contract for payment services is deemed to have been given if the user does not notify the provider of their rejection prior to the proposed date of entry into force of the amendments. In such a case, the payment service user is entitled to terminate the framework contract for payment services without notice and free of charge before the proposed date of entry into force of the amendments. The payment service provider is obliged, when submitting the proposal to amend the framework contract, to inform the payment service user of the consequences of their silence as well as of their right to terminate the contract without costs and without a notice period [8, art. 675g].

The advantage of this method of amending the framework contract for payment services for the payment service user is evident: the user was required to take action only if they did not agree with the proposed amendments [10, p. 3]. In German legal scholarship, this method of amending banks' general terms and conditions namely through clauses based on the fiction of consent was, in light of Sections 308 No. 5 and 675g GCC, almost unanimously regarded as permissible. Only in isolated cases were such clauses considered impermissible, due to a lack of sufficient specificity regarding the grounds and scope of the amendments [1, p. 231-232].

4. THE LEGAL POSITION UNDER GERMAN LAW AFTER 27 APRIL 2021

Then came a turning point brought about by the German Federal Court of Justice, which caused considerable controversy. In its so-called Postbank decision [13], relying on the DenizBank judgment of the Court of Justice of the European Union [14] of 11 November 2020, the Court declared invalid the mechanism for amending banks' general terms and conditions through clauses based on the fiction of consent a mechanism that banks had used for decades and that had generally been regarded as legally permissible.

Article 54 of the Payment Services Directive provides that any amendments to a framework contract for payment services must be proposed by the payment service provider two months before the proposed date of their application at the latest. The payment service user may accept or reject the amendments before the proposed date of their entry into force. The payment service provider must inform the payment service user that the amendments are deemed accepted if the user does not notify the provider, before the proposed date of entry into force, that they reject them. The payment service provider must also inform the payment service user that, in the event of rejection, the user has the right to terminate the framework contract free of charge and with effect at any time up to the date on which the amendments would have been implemented [12, art. 54].

In the DenizBank case, the Court of Justice of the European Union had to clarify whether clauses that strictly comply with the requirements of Article 54 of the Payment Services Directive may nevertheless, in the context of consumer contracts, be classified as unfair under Article 3(1) of Council Directive

93/13/EEC of 5 April 1993 on unfair terms in consumer contracts (hereinafter: the Unfair Terms Directive) [15]. Article 3(1) provides that a contractual term which has not been individually negotiated is to be regarded as unfair if, contrary to the requirement of good faith, it causes a significant imbalance in the parties' rights and obligations to the detriment of the consumer [15, art. 3 para. 1]. The Court of Justice held that standard terms allowing for unilateral contract adjustments must also comply with the requirements of Article 3 of the Unfair Terms Directive with regard to good faith, balance, and transparency [16, p. 48].

When applied to German law, this means that even if clauses in general terms and conditions based on the fiction of declaration of intent comply with the requirements of Sections 308 No. 5 and 675g GCC, this does not imply that, in contractual relationships with consumers, they are exempt from substantive control under Section 307 GCC. Under this provision, clauses in general terms and conditions are invalid if, contrary to the principle of good faith, they unreasonably disadvantage the contractual partner of the user of the general terms and conditions. Such unreasonable disadvantage may arise, in particular, from a lack of clarity and comprehensibility. In cases of doubt, an unreasonable disadvantage is presumed if the clause is incompatible with the essential fundamental principles of the statutory provisions from which it deviates, or if it restricts essential rights and obligations arising from the nature of the contract in such a way as to jeopardize the achievement of the contractual purpose [8, art. 307].

Accordingly, even where a clause based on the fiction of declaration of intent satisfies the requirements of Sections 308 No. 5 and 675g GCC, it may nevertheless, from a substantive perspective, cause an unreasonable disadvantage to the contractual partner within the meaning of Section 307 GCC. In summary, while Section 308 No. 5 GCC establishes the formal minimum requirements applicable to all types of fictions of declaration of intent, their actual effects and their appropriateness must be assessed under Section 307 GCC.

More specifically, for a clause based on the fiction of declaration of intent to pass substantive control under Section 307 GCC, the user of the general terms and conditions must have a legitimate interest in the occurrence of the fiction of declaration of intent. According to the case law of the German Federal Court of Justice, such a legitimate interest exists where it is necessary for a legal relationship to be easily adaptable and where the declaration attributed to the other contractual party does not cause that party any unreasonable disadvantage. More specifically, a legitimate interest exists in using clauses based on the fiction of declaration of intent that enable the efficient handling of mass transactions, which is precisely the case with clauses based on the fiction of consent for amendments to banks' general terms and conditions. Due to the need to rationalize banking operations, such clauses were therefore, in principle, regarded as permissible [1, p. 227-228].

The decision of the German Federal Court of Justice caused a tectonic shift in practice, since almost all private banks in Germany use the same general terms and conditions. From that point onward, bank clients were required to give explicit consent to amendments to the general terms and conditions. Thus, the system shifted from a fiction of consent to express consent, which in practice led to significant costs and frustration not only for banks, but also for their clients. The legal uncertainty created by the decision resulted in banks having to obtain explicit consent from clients in more than 100 million ongoing contractual relationships in order to close contractual gaps arising from the ruling of the German Federal Court of Justice [10, p. 3].

The disputed clause in banks' general terms and conditions read as follows: "Amendments to the general terms and conditions shall be offered to the client in text form two months before the proposed date of their entry into force at the latest. The client may accept or reject the proposed amendments before the proposed date of their entry into force. The client's consent to the amendments shall be deemed to have been given if the client does not notify the bank of the rejection of the proposed amendments before the proposed date of their entry into force. The bank shall expressly draw the client's attention, in its offer, to the approving effect of the client's silence." e

In the reasoning of the judgment, the Court stated the following: the above-mentioned clause in banks' general terms and conditions deviates from the essential fundamental principles of Section 305(2) GCC (according to which general terms and conditions become part of a contract only if the contractual partner of the user agrees to their applicability) [8, art. 305, para. 2] and Section 311(1) GCC (which requires an agreement between the parties both for the establishment of an obligation through a legal transaction and for any amendment of its content) [8, art. 311, para. 1], in that it qualifies the bank client's silence regarding the proposed contractual amendments as acceptance. Such a deviation unreasonably disadvantages the bank client. An unreasonable disadvantage is presumed where a clause deviates from the essential fundamental principles of statutory law. This presumption could be rebutted if, following a comprehensive balancing of the interests of the bank and the client, the deviation from the statutory model were objectively justified and the achievement of the statutory protective purpose ensured by other means. This was not the case here, since the clause allows, through the fiction of consent, the complete restructuring of the contractual framework if the client does not reject the proposed amendments. The consumer would have to take action not in favor of, but against, the amendment of the contract. The reasons for the consumer's inactivity whether lethargy, lack of interest, cognitive overload, helplessness, illness, or even actual consent to the proposed amendments are irrelevant to the legal effect of the clause. As a result, the clause effectively grants the bank an unlimited substantive right to amend an existing contract with the consumer. However, for far-reaching amendments affecting the foundations of the legal relationship between the parties, and which in fact approach the conclusion of a new contract, an agreement amending the existing contract is required in accordance with the requirements of Sections 305(2) and 311(1) GCC [17, str. 11-12].

5. A BRIEF COMMENTARY ON THE REASONING OF THE GERMAN FEDERAL COURT OF JUSTICE

The German Federal Court of Justice declared the contested clause in banks' general terms and conditions invalid in consumer contracts. However, the Court did not generally invalidate clauses based on the fiction of consent as such. Instead, its objection was directed at the unlimited scope of the specific clause at issue. The Court was concerned that banks could use such a clause to alter the legal nature of the contract, substantially restructure an existing contractual relationship, or introduce new fees that had not previously been agreed upon.

Although clauses based on the fiction of consent are explicitly permitted under Section 675g GCC, they nevertheless remain subject to substantive judicial review under Section 307 **GCC** [11, str. 1]. The argument that Section 675g GCC precludes such substantive review was expressly rejected by the German Federal Court of Justice, which relied on the DenizBank judgment of the Court of Justice of the European Union. According to the Court, Section 675g GCC constitutes a special provision applicable exclusively to framework contracts for payment services. From this special rule, it cannot be inferred that banks generally have an unrestricted right to employ clauses based on the fiction of consent in their general terms and conditions [18, str. 2]. Outside this narrowly defined exception, consumer protection takes precedence, which includes the courts' authority to review clauses based on the fiction of consent in general terms and conditions [ibidem].

Pursuant to Section 307 GCC, clauses in general terms and conditions are invalid if they unreasonably disadvantage the contractual partner of the user of those terms. Such disadvantage is presumed where a clause deviates from the statutory model and is incompatible with its essential fundamental principles. Clauses based on the fiction of consent fail to withstand substantive review under Section 307 GCC because they deviate from the core principles of Sections 305(2) and 311(1) GCC, which require explicit consent for contractual amendments. Silence does not constitute a declaration of intent and, as a general rule, indicates neither approval nor rejection of proposed contractual changes. Where silence is nevertheless attributed legal effect, this constitutes a deviation from the fundamental statutory principle. By employing clauses based on the fiction of consent, banks created an instrument that allowed them, through a fictitious declaration, to fundamentally reshape the contractual structure [ibid, p. 1].

In consumer contracts, such clauses effectively amount to a unilateral and substantively unrestricted right of the bank to amend the contract, since the consumer is required to take action not in favor of, but rather against, a contractual amendment desired by the bank. This deviation from the statutory model also results in an unreasonable disadvantage for the client, as it cannot be justified by the banks' interests, even after a comprehensive balancing of interests [ibid, str. 1]. While banks may legitimately seek simplified contract execution, this objective can be achieved through restrictively and precisely formulated clauses. Accordingly, the German Federal Court of Justice did not entirely exclude the possibility of sufficiently specific clauses based on the fiction of consent [11, str. 3].

The Court further criticized the indeterminate scope of the clause at issue, noting that it could, in extreme cases, enable banks to alter the nature of the contract itself or to completely restructure the pricing system. Thus, in the Postbank decision, the German Federal Court of Justice identified a violation of Section 307 GCC in the overly broad formulation of the clause, as it did not merely allow for the amendment of individual details, but rather permitted any amendment to existing contracts without substantive or subject-matter limitations. In doing so, the clause deviated from the essential fundamental principles of Sections 305(2) and 311(1) GCC by qualifying the client's silence as acceptance of the proposed contractual amendment.

Such an excessively broad clause consequently results in an unreasonable disadvantage for the client, as it enables the bank, through the fiction of declaration of intent and in the absence of an explicit rejection by the client, to disturb the contractual equilibrium between performance and counter-performance in its own favor. Therefore, even in the context of mass transactions, fictions of declaration of intent lose their justificatory basis and unreasonably disadvantage clients if they lack any discernible limits and thus permit unrestricted amendments, including amendments affecting the core contractual obligations [1, p. 232].

6. IN LIEU OF A CONCLUSION: A PROPOSAL FOR GERMAN LAW AND A BRIEF REFLECTION ON SERBIAN LAW

The economic justification for amending banks' general terms and conditions through fictions of declaration of intent is beyond dispute. Nevertheless, the legal permissibility of clauses based on such fictions in banks' general terms and conditions is, at the very least, debatable. While a significant part of German legal scholarship considers such clauses to be permissible, the German Federal Court of Justice has taken a contrary view. Regardless of this divergence, the Postbank decision has generated substantial legal uncertainty and practical difficulties that remain unresolved to this day.

One possible solution to the newly emerged situation is legislative intervention in the form of an amendment to Section 675g GCC. Specifically, Section 675g GCC should be supplemented by the following rule: an agreement within the meaning of Section 675g GCC does not constitute an unreasonable disadvantage within the meaning of Section 307 GCC, provided that the requirements of Section 308 No.

5 GCC are satisfied and that the contractual relationship cannot be substantially restructured through amendments to the general terms and conditions. The initial introduction of any fee should, however, require the explicit consent of the payment service user [11, p. 23]. This proposal incorporates the limitations demanded by the German Federal Court of Justice, adequately takes into account consumer interests, and is suitable to provide German banks with a statutory basis for a legally certain and mass-transaction-compatible mechanism for amending their general terms and conditions [10, str. 5].

As regards Serbian law, the Law on Payment Services [19], in Article 18, provides a solution identical to that set out in Article 54 of the Payment Services Directive and Section 675g GCC. The modest contribution of this paper primarily aimed at the domestic legal community lies in its informative character. In the event of disputes concerning the application of Article 18 of the Law on Payment Services, Serbian courts will be required to take into account the DenizBank judgment of the Court of Justice of the European Union and to subject clauses based on the fiction of amendment in banks' general terms and conditions although compliant with the requirements of Article 18 of the Law on Payment Services to additional substantive review in consumer contracts. This approach is particularly warranted given that the Republic of Serbia, pursuant to Article 72 of the Law on the Ratification of the Stabilisation and Association Agreement between the European Communities and their Member States, on the one hand, and the Republic of Serbia, on the other, is obliged to harmonize its legislation with the acquis communautaire [20, art. 72].

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О ПРАВНОЈ ДОПУШТЕНОСТИ И ЕКОНОМСКОЈ ОПРАВДАНОСТИ ИЗМЕНА ОПШТИХ УСЛОВА ПОСЛОВАЊА БАНАКА ПУТЕМ ФИКЦИЈА ИЗЈАВЕ

Резиме: *Аутори се у раду баве питањем економске оправданости и правне допуштености измена општих услова пословања банака путем фикција изјаве. Најпре, аутори наводе економске разлоге који иду у прилог таквом начину измене општих услова пословања банака. Затим, дају аутори приказ правне ситуације у Немачкој пре Постбанк одлуке немачког Савезног врховног суда, азатим приказ новонастале правне ситуације у Немачкој након те одлуке. На крају, уместо закључка, аутори дају осврт на правну ситуацију у српском праву о истом правном проблем.*

Кључне речи: *општи услови пословања, банке, потрошачи, клаузуле са фикцијом изјаве, економска оправданост, правна допуштеност*

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ALIGNMENT OF THE LEGAL FRAMEWORK OF HIGHER EDUCATION IN THE REPUBLIC OF SERBIA WITH EU STANDARDS AS REGARDS THE CONSTITUTIONAL AUTONOMY OF UNIVERSITIES

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Abstract: *This paper examines the constitutional content, scope, and limits of university autonomy in the Republic of Serbia in the context of intensified administrative regulation of higher education and the Europeanisation of normative standards. The central premise of the study is that the constitutional guarantee of university autonomy and academic freedom must be balanced with the requirements of legality and public accountability in the fields of quality assurance, accreditation, and financial governance.*

The research addresses four main questions: (1) what constitutes the normative "core" of constitutional university autonomy; (2) how to distinguish legitimate public oversight from undue interference in the academic, organisational, staffing, and financial dimensions of autonomy; (3) to what extent Serbian higher education legislation is aligned with European standards concerning institutional independence and quality assurance; and (4) which criteria should guide constitutional review in cases involving sanctions imposed on higher education institutions.

The methodological framework combines doctrinal legal analysis, interpretation of relevant European higher education instruments and standards, comparative alignment mapping, and the application of the proportionality test within the broader requirements of the rule of law, legal certainty, and foreseeability of sanctions.

The findings indicate a high level of principled textual convergence between the national and European normative frameworks, accompanied by structural challenges in the institutional design of the accreditation system and in the predictability of sanctioning mechanisms. These issues have direct implications for the protection of academic freedom and the democratic function of universities. The paper contributes to the theoretical clarification of the constitutional core of university autonomy under conditions of ongoing Europeanisation of higher education governance.

Keywords: *constitutional university autonomy; academic freedom; principle of legality; rule of law; quality assurance; accreditation; proportionality; Europeanisation*

1. INTRODUCTION

University autonomy constitutes one of the fundamental constitutional guarantees of the modern democratic state because it provides the institutional framework for freedom of teaching, scientific research, artistic creativity, and critical thinking. Within the legal order of the Republic of Serbia, this value enjoys constitutional rank. Article 72 of the Constitution of the Republic of Serbia guarantees the autonomy of universities, higher education institutions, and scientific institutions, and provides that they shall independently decide on their organisation and operation in accordance with the law, while Article 73 guarantees freedom of scientific and artistic creativity [1, Arts. 72–73]. It follows that, in domestic law, university autonomy is not merely an organisational principle of the higher education system, but a distinct institutional guarantee intended to protect the free creation, transmission, and critical examination of knowledge.

At the same time, the contemporary development of higher education demonstrates that university autonomy can no longer be seen as a normatively isolated sphere, detached from every form of public-law regulation. On the contrary, modern higher education systems are structured as fields in which the constitutional guarantee of institutional independence intersects with legality, public accountability, and quality assurance. The current Law on Higher Education is founded on the principle that higher education is of special significance to the Republic of Serbia. It recognizes higher education as an integral part of the international, particularly European, educational, scientific, and artistic community, and establishes that it is grounded in academic freedom, institutional autonomy, academic integrity, transparency, and other fundamental principles governing the higher education system [2]. The consolidated text of the Law also includes the amendments published in Official Gazette of the Republic of Serbia, No. 19/2025, which makes the subject particularly relevant from a normative perspective [2].

Accordingly, the central problem of this paper is not whether the state may regulate higher education, but what the constitutional limits of such regulations are. The decisive issue is where legitimate public intervention aimed at protecting quality, legality, and accountability ends, and where impermissible interference with the academic, organisational, staffing, and financial autonomy of the university begins. It is precisely in this borderline area that the principal constitutional-law problem arises: under what conditions do accreditation, external evaluation, financing, supervision, and digitalised procedures remain within the boundaries of constitutionally permissible regulation, and under what conditions do they become disproportionate restrictions upon constitutionally guaranteed university autonomy?

This issue acquires particular weight in light of European standards, which serve as a relevant benchmark for assessing the alignment of the domestic legal framework. Within European Union law, particular significance is accorded to Article 13 of the Charter of Fundamental Rights of the European Union, which guarantees that the arts and scientific research are free from undue constraint and affirms that academic freedom must be respected [3, Art. 13]. In addition, the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG 2015) represent the generally accepted European framework for internal and external quality assurance [4]. Accordingly, although the title of this paper refers to EU standards, it is analytically justified to examine the subject within a broader European normative context encompassing both EU law and the standards of the European Higher Education Area.

This paper examines the alignment of the Serbian legal framework on higher education with EU standards concerning the constitutional autonomy of universities, with particular emphasis on the constitutional content of autonomy, the scope and limits of public-law regulation, and the normative and institutional mechanisms through which that relationship is concretised. The aim of the paper is to determine the normative core of the constitutional autonomy of universities in the Republic of Serbia, identify the principal regulatory instruments in the fields of accreditation, quality assurance, supervision, financing, and digitalisation, to assess the degree of their alignment with relevant European standards, and to offer constitutional-law criteria for evaluating the permissibility of restrictions on university autonomy.

The paper argues that the Serbian legal framework shows substantial normative convergence with European standards at the level of proclaimed principles and basic institutional solutions, but that certain aspects of legislative elaboration and institutional implementation still create risks of excessive discretion, insufficient legal certainty, and disproportionate encroachment upon the constitutional core of university autonomy. Particularly sensitive are those areas in which public-law powers are exercised through control, sanctioning, supervision, or financial conditioning, especially where such measures are not accompanied by sufficiently clear procedural guarantees, reasoned decisions, and effective legal remedies. For that reason, the constitutional-law assessment of restrictions on university autonomy cannot be based solely on the formal existence of statutory authority, but must also include an examination of legitimacy of aim, suitability, necessity, and proportionality in the strict sense.

2. RESEARCH QUESTIONS AND BASIC THESES

Starting from the premise that university autonomy in the Republic of Serbia is a constitutionally guaranteed institutional safeguard rather than a mere legislative convenience, the principal research problem of this paper consists in determining the boundaries between legitimate public-law regulation of the higher education system and impermissible encroachment upon the academic, organisational, staffing, and financial independence of universities [1, Arts. 72–73; 2]. The complexity of this issue is reinforced by the fact that the contemporary higher education system no longer develops exclusively within domestic law, but under conditions of strong Europeanisation of normative standards, institutional models, and quality assurance mechanisms [3, Art. 13; 4]. In that regard, Article 13 of the Charter and the framework established by ESG 2015 represents relevant benchmarks for assessing the degree of alignment of the domestic legal framework with standards protecting academic freedom and institutional independence [3, Art. 13; 4, pp. 7–12]. The judgment of the Court of Justice of the European Union in Commission v. Hungary (Higher education), C-66/18, further confirms that restrictions affecting the operation of higher education institutions are subject to strict review from the standpoint of academic freedom and other guarantees of EU law [5].

The paper assumes that alignment of the Serbian legal framework with European standards cannot be assessed solely by the formal adoption of concepts such as autonomy, academic freedom, quality, and transparency, but only by examining their actual normative reach in legislative elaboration and institutional implementation [1, Arts. 72–73; 2; 3, Art. 13; 4]. For that reason, the analysis addresses four core research questions, followed by one additional methodological question concerning the proportionality test.

First, what constitutes the normative core of the constitutional autonomy of universities in the Republic of Serbia, that is, which elements of autonomy are constitutionally guaranteed and legally inalienable [1, Arts. 72–73; 2]? This includes the issue whether autonomy covers only general institutional independence or necessarily extends to the protection of teaching, scientific work, internal organisation, staffing policy, study programme design, and international cooperation.

Second, to what extent is the current legal framework of higher education in the Republic of Serbia aligned with European standards relating to academic freedom and institutional independence [2; 3, Art. 13; 5]? In this context, the analysis examines whether the current Law on Higher Education, including the amendments published in Official Gazette of the Republic of Serbia, No. 19/2025, provides merely declaratory references to European standards or reflects deeper normative convergence in the very model of legal regulation [2].

Third, are the mechanisms of accreditation, quality assurance, supervision, financing, and digitalisation structured as legitimate instruments of public accountability, or do they leave excessively broad room for discretion and indirect limitation of university autonomy [2; 4, pp. 7–12]? This question concerns the clarity of decision-making criteria, transparency of procedures, adequacy of reasoning, and the existence of effective legal remedies.

Fourth, which constitutional-law criteria should be used to distinguish permissible regulation from impermissible state interference in the academic, organisational, staffing, and financial sphere of university independence [1, Arts. 72–73; 2; 3, Art. 13; 5]? The paper proceeds from the view that the state's power to regulate higher education is not, in itself, disputed; rather, the issue is the extent to which such regulation remains within constitutional limits and does not become an instrument of excessive control over an institution whose freedom is a precondition of its public mission [1, Arts. 72–73; 5].

Fifth, can the proportionality test, together with the principles of the rule of law, legal certainty, reasoned decision-making, and effectiveness of legal remedies, be regarded as the most appropriate analytical instrument for assessing the constitutional permissibility of restrictions on university autonomy [1, Arts. 72–73; 3, Art. 13; 5]?

The general thesis of the paper is that the Serbian legal framework demonstrates a significant degree of normative alignment with European standards in the field of university autonomy at the level of proclaimed principles and basic institutions, but that weaknesses remain in legislative elaboration, institutional design, and practical implementation, capable of leading to disproportionate interference with academic, organisational, staffing, and financial independence [1, Arts. 72–73; 2; 3, Art. 13; 4; 5]. More specifically, the paper maintains that university autonomy in the Republic of Serbia has the character of a constitutionally guaranteed institutional safeguard [1, Arts. 72–73]; that European standards do not exclude state regulation, but subject it to legality, legitimacy, necessity, and proportionality [3, Art. 13; 5]; that accreditation and quality assurance are acceptable only if structured as genuine instruments of improvement rather than indirect political or administrative conditioning [2; 4, pp. 7–12]; that formal adoption of the vocabulary of autonomy and quality does not in itself amount to substantive alignment [2; 3, Art. 13; 5]; and that the greatest risks to autonomy arise not merely from the existence of regulation, but from indeterminate criteria, broad discretion, and insufficient procedural guarantees [2; 4; 5]. Finally, the paper maintains that any constitutionally sound evaluation of restrictions on university autonomy must be based on the proportionality test [1, Arts. 72–73; 3, Art. 13; 5].

3. THE CONSTITUTIONAL-LAW CONTENT OF UNIVERSITY AUTONOMY

The constitutional-law scope of university autonomy in the Republic of Serbia cannot be reduced to a matter of organisational design of the higher education system. It is a constitutional guarantee of broader institutional and democratic significance because it protects the free formation, development, and transmission of knowledge within higher education and scientific activity [1, Arts. 72–73]. The fact that the Constitution simultaneously guarantees the autonomy of universities, higher education institutions, and scientific institutions, as well as the freedom of scientific and artistic creativity shows that this guarantee is conceived as a means of protecting the academic sphere against impermissible external influence rather than as a merely symbolic proclamation [1, Arts. 72–73; 3, Art. 13].

In legal terms, university autonomy denotes the capacity of a higher education institution to regulate and conduct independently those affairs that constitute the core of its teaching, scientific, organisational, and developmental functions [1, Arts. 72–73; 2, Arts. 4–6]. It encompasses institutional independence, but also the conditions under which academic freedoms may be genuinely, rather than only formally, exercised. For that reason, autonomy has a dual structure: it denotes the independence of the institution, while simultaneously creating the normative framework within which teachers, researchers, and other academic actors can exercise freedom of teaching and research [1, Arts. 72–73; 3, Art. 13].

These two dimensions are mutually dependent. If the institution lacks real independence, academic freedoms remain exposed to external influence and lose effective protection. Conversely, if institutional independence exists without genuine freedom of scientific and teaching activity within it, autonomy itself becomes formal and deprived of constitutional meaning [1, Arts. 72–73; 3, Art. 13]. University autonomy must therefore be interpreted not as a list of isolated powers, but as a complex institutional safeguard.

The Law on Higher Education elaborates this constitutional guarantee by listing academic freedoms, autonomy, and academic integrity among the basic principles of higher education, and by defining its concrete content more closely [2, Arts. 4–6]. At the statutory level, this guarantee encompasses internal organisation, adoption of statutes and general acts, election of bodies, establishment of study programmes and study rules, selection of teachers and associates, decision-making on international cooperation and projects, and disposition of resources in accordance with the law [2, Art. 6]. In domestic law, autonomy is thus expressed as academic, organisational, staffing, programme-related, and partly financial independence.

University autonomy performs at least three functions. First, it has a protective function, in that it prevents impermissible political, administrative, ideological, or other interference with teaching, scientific research, and internal academic decision-making [1, Arts. 72–73; 3, Art. 13]. From this perspective, autonomy is not an institutional privilege, but a legal mechanism for safeguarding free production of knowledge and critical thought. Second, it has a functional dimension: without the ability independently to organise programmes, regulate the teaching process, select academic staff, and plan institutional development, the university would be incapable of performing the public service of higher education in accordance with its nature and purpose [2, Art. 6]. Third, it has a guarantee function in relation to quality and integrity. European standards do not assume an opposition between autonomy and public accountability, but rather their mutual interdependence. ESG 2015 derives from the idea that higher education institutions bear primary responsibility for quality, which means that institutional independence and quality assurance presuppose one another [4, pp. 7–12].

The minimum constitutional-law guarantees of autonomy consist of those institutional positions without which the constitutional guarantee would be reduced to a merely formal proclamation. These include academic freedom in the narrow sense, namely freedom of scientific and artistic research, freedom of teaching, and freedom of academic expression [1, Art. 73; 2, Art. 5; 3, Art. 13]; organisational independence, including the right to regulate internal structure and establish governing bodies [2, Art. 6]; staffing independence, meaning that selection of teachers and associates must rest on academic rather than political or arbitrary criteria [2, Art. 6]; programme-related independence, including the right to determine study programmes and study rules [2, Art. 6]; and a certain degree of financial independence, since autonomy easily becomes illusory without the capacity to dispose of resources and plan institutional development [2, Art. 6].

Yet the constitutional minimum is not exhausted by a catalogue of powers. It necessarily includes procedural guarantees. Autonomy is not genuinely protected where supervisory, accreditation, sanctioning, or financially conditioning procedures are unclear, unpredictable, or left to broad discretion. The constitutional standard therefore requires that any restriction upon autonomy be provided by law, directed toward a legitimate aim, based on predetermined criteria, reasoned, and subject to effective legal review [1, Arts. 72–73; 3, Art. 13; 5]. Without such procedural safeguards, autonomy would be reduced to a formula lacking real legal force.

4. EUROPEAN STANDARDS AS A BENCHMARK FOR ALIGNMENT

The assessment of alignment of the Serbian legal framework with European standards cannot rest on formal comparison of concepts or superficial institutional similarity. In legal terms, alignment exists only where the domestic normative model ensures a comparable level of protection of academic freedom, institutional independence, legal certainty, and procedural control in relation to the relevant European benchmarks [3; 4]. In this paper, European standards are employed not as an expression of external political orientation, but as a legal and analytical benchmark for assessing whether domestic legal solutions remain within the boundaries of legitimate regulation or instead amount to an impermissible encroachment upon the constitutional core of university autonomy.

Two normative levels must be distinguished. The first is European Union law in the strict sense, within which Article 13 of the Charter of Fundamental Rights of the European Union has special importance [3, Art. 13]. The second consists of the standards of the European Higher Education Area, among which ESG 2015 carry particular weight as the generally accepted benchmark for internal and external quality assurance [4, pp. 7–12]. Although these two levels do not have identical legal nature, their combined relevance lies in the fact that both set limits to state intervention in higher education while also defining the conditions under which control, evaluation, and public accountability remain legally acceptable.

Article 13 of the Charter provides that the arts and scientific research shall be free of constraint and that academic freedom shall be respected [3, Art. 13]. This provision does not merely proclaim academic freedom as a political value of declaratory character; it establishes it as a legally protected position within the system of fundamental rights of the European Union. The normative reach of Article 13 lies first in the protection of scientific work and academic activity against unjustified restrictions. In addition, the provision cannot be understood exclusively as a guarantee of the individual freedom of teachers and researchers. Its full meaning also encompasses an institutional dimension, since academic freedom cannot be genuinely secured unless higher education and scientific institutions enjoy a minimum degree of independence in matters directly affecting teaching, research, and internal academic decision-making [3, Art. 13].

This standard is further reinforced by the case law of the Court of Justice of the European Union. In Commission v. Hungary (Higher education), C-66/18, the Court made clear that restrictions in the field of higher education cannot remain outside review of conformity with academic freedom and other relevant guarantees of EU law [5]. The broader significance of that judgment lies in its recognition that academic freedom has real normative substance and that state regulation of higher education is subject to review not only from the standpoint of formal legality, but also from the standpoint of its impact upon the essence of academic activity [5].

Unlike the Charter, ESG 2015 do not formally belong to EU law, but they possess very strong normative-guiding significance within the European Higher Education Area [4, pp. 7–12]. Their importance lies in the fact that they provide the most relevant European standard for understanding the relationship between institutional autonomy, internal responsibility of the institution, external evaluation, and the legal structuring of quality assurance procedures. Their basic premise is that higher education institutions themselves bear primary responsibility for quality [4, pp. 7–9]. If that is so, then institutions must also be granted genuine space to shape their internal academic and organisational processes independently. The European standard therefore does not support a model in which quality is ensured exclusively by external administrative control, but one in which the institution carries the internal system of quality assurance, while external review has a corrective, evaluative, and developmental function [4, pp. 7–12].

Four elements of ESG 2015 are particularly relevant here. Quality assurance procedures must be normatively clear and known in advance [4, pp. 18–20]. They must be based on transparent and uniform criteria [4, pp. 20–22]. They must be professional, consistent, and directed toward improvement rather than arbitrary sanctioning [4, pp. 22–25]. Finally, they must be accompanied by a fair procedure and reviewable decisions [4, pp. 25–27]. These elements demonstrate that the issue of quality cannot be separated from the limitation of discretion, the duty to give reasons, and procedural protection.

For the purposes of this paper, the decisive point is that European standards must be used as a benchmark of substantive, not merely formal, alignment. It is not enough that domestic legislation adopts the vocabulary of academic freedoms, autonomy, quality, and transparency. It must be established whether those principles are linked to institutional and procedural arrangements that genuinely protect university independence while at the same time ensuring legitimate public accountability [2; 3; 4; 5]. Article 13 of the Charter establishes the basic normative standard of respect for academic freedom, while ESG 2015 provide more concrete criteria for assessing how mechanisms of quality assurance and external evaluation must be legally shaped in order to remain compatible with institutional autonomy [3, Art. 13; 4, pp. 7–12]. Their combined effect is to show that university autonomy is neither an obstacle to state regulation nor an object freely disposable by public authority. It is a legally protected institutional position that may be restricted only under conditions of legality, legitimate aim, professional justification, procedural predictability, and proportionality [3, Art. 13; 4, pp. 7–12; 5].

5. CRITICAL ANALYSIS OF THE LAW ON HIGHER EDUCATION WITH A FOCUS ON THE 2025 AMENDMENTS

A critical analysis of the current Law on Higher Education must distinguish between formal normative alignment and substantive alignment. Formal alignment exists when the law adopts the vocabulary of academic freedoms, autonomy, quality, and European openness. Substantive alignment exists only where institutional arrangements, the allocation of powers, decision-making procedures, and control mechanisms genuinely secure a balance between public accountability and the constitutional core of university independence [2; 3, Art. 13; 4, pp. 7–12]. For that reason, the 2025 amendments cannot be assessed unilaterally: they simultaneously contain elements of normative convergence with European standards and zones of constitutional-law risk requiring stricter analysis [2].

On the side of convergence, the current law retains the clear normative premise that higher education is based on academic freedoms, autonomy, academic integrity, openness to the public, and alignment with the European higher education system [2]. That is not, in itself, sufficient for an assessment of substantive alignment, but it constitutes an important normative precondition. The Law also reinforces the procedural framework governing accreditation by more clearly institutionalising the Commission for Appeals as the body responsible for deciding appeals against decisions rejecting accreditation applications, while further regulating its composition, term of office, and safeguards designed to ensure professional expertise [2]. From the standpoint of the rule of law and procedural fairness, this is a notable improvement, since it makes the quality assurance system less closed and less strictly single-tiered [2; 4, pp. 18–27].

Another important zone of convergence is financial support. The 2025 amendments require the founder to provide higher education institutions with resources for permanent costs, certain employee-related expenditures, and the costs of accreditation, together with additional rules relating to salary calculation bases and minimum standards of budgetary coverage [2]. From the standpoint of institutional autonomy, these amendments matter because autonomy without minimal financial stability remains vulnerable and susceptible to indirect conditioning. A further relevant change is the strengthening of the internal position of the academic community within governance bodies: amendments to Article 62 reduced the share of founder representatives and increased the share of employees' representatives [2]. This change is a relevant signal of stronger internal independence [2]. Finally, the introduction of micro-credentials, postdoctoral training, and stronger recognition of artistic-research work reflect compatibility with contemporary European developments in the diversification of learning and research [2; 4, pp. 7–12].

At the same time, significant risks remain. The first is the structure of the accreditation and supervisory system. Although the introduction of the appellate commission strengthens procedural protection, it remains within the institutional framework of the National Accreditation Body. External quality review is conducted regularly during the accreditation cycle, but may also be initiated extraordinarily, including at the request of other competent actors [2]. This means that procedural protection is stronger than before, but not fully externally independent. The solution is not necessarily unconstitutional, but it requires restrictive interpretation and strict, predetermined criteria for the activation of extraordinary review [2; 4, pp. 18–27].

The second risk is the breadth of regulatory and standard-setting powers in the quality assurance system. The National Council and the National Accreditation Body play a major role in shaping standards, procedures, and criteria that concretise the statutory framework [2]. Although such a model is functionally understandable, it creates a risk that the substantive scope of university independence will, in practice, be shaped by intensive by-law standards and procedures [2; 4, pp. 18–27]. Substantive alignment with European standards therefore depends not only on the text of the law, but also on the clarity, proportionality, and predictability of the standards themselves [3, Art. 13; 4, pp. 18–27].

The third risk is related to digitalisation and reliance on data from unified information systems. The law links certain aspects of financing and system governance to data collected through educational information systems [2]. That may be rational and useful, but if the law and by-law elaboration do not ensure sufficiently clear guarantees regarding data accuracy, correction of errors, transparency of methodology, and legal protection against consequences arising from such data, digitalisation may become an indirect channel for strengthening administrative control over institutions [2; 5]. This is a constitutional-law risk by its nature, not a ready-made conclusion of unlawfulness.

The fourth risk is financial conditioning as an indirect means of influence. The expansion of budgetary support undoubtedly strengthens the material conditions for the functioning of public higher education institutions [2]. Yet precisely because the law expands the range of purposes for which resources are provided, the question becomes even more important whether the rules on allocation, monitoring, and possible withdrawal of such resources are precise and procedurally controllable [2]. The constitutional-law problem does not lie in budgetary financing as such, but in the possibility that financial dependence, if not accompanied by sufficiently clear safeguards, may produce indirect conditioning of institutional conduct [1, Arts. 72–73; 2; 5].

The fifth risk concerns the reach of governance reform. The reduction in the share of founder representatives and the increase in the share of employee representatives is a relevant signal of stronger internal independence [2]. Yet that quantitative change does not resolve all issues of constitutional autonomy [1, Arts.

72–73; 2]. It does not remove the need clearly to define the limits of the founder's influence over supervision, financing, accreditation, and other forms of public-law intervention [2]. In other words, improvement in the composition of governance bodies is important, but insufficient by itself to neutralise other channels of public control.

The overall result is therefore mixed. The 2025 amendments strengthen certain material and procedural preconditions for more effective functioning of higher education institutions, especially in the fields of financing, appellate protection, and internal participation of the academic community in governance [2]. At the same time, they do not fully remove risks arising from concentration of standard-setting and supervisory powers, extraordinary review, digitalisation without sufficiently developed procedural guarantees, and structural financial dependence [2; 3, Art. 13; 4, pp. 18–27; 5]. For that reason, the final constitutional-law assessment of this legal framework cannot be derived from description alone, but must be tested through the proportionality test.

6. THE CONSTITUTIONAL-LAW PROPORTIONALITY TEST FOR RESTRICTIONS ON AUTONOMY

The constitutional assessment of restrictions on university autonomy cannot be reduced to the question whether the state is authorised to regulate higher education, because that approach would reduce the constitutional guarantee of autonomy to a merely declaratory formula without any real limiting effect on legislative and administrative power [1, Arts. 72–73; 3, Art. 13; 5]. The constitutionally relevant issue is therefore not whether intervention exists, but under what conditions it is permissible. The answer is provided by the proportionality test, which serves as the principal instrument for distinguishing legitimate public-law regulation from impermissible encroachment upon the constitutional core of university independence [1, Arts. 72–73; 3, Art. 13; 5].

By its nature, the constitutional guarantee implies that university autonomy is not absolute. The state may prescribe rules in the areas of accreditation, quality assurance, supervision, financing, and public records because these are areas in which a legitimate public interest exists [2; 4, pp. 7–12]. However, such powers are not unlimited. A restriction is constitutionally acceptable only if it is based on a sufficiently determinate legal norm, directed toward a legitimate aim, suitable for achieving that aim, necessary in the sense that no less restrictive measure exists, and proportionate in the strict sense, that is, only if the benefit it produces is not disproportionate to the intensity of the interference with academic and institutional independence [1, Arts. 72–73; 3, Art. 13; 5].

It is not enough for the legislature or the competent authority merely to invoke quality, legality, public interest, or budgetary responsibility. Such invocation acquires constitutional significance only if it is accompanied by clear criteria, a predictable procedure, limited discretion, a reasoned decision, and effective legal protection [2; 4, pp. 18–27; 5]. Otherwise, even a formally legitimate aim may become a means of excessive intervention. Precisely for that reason, proportionality in this field does not have a merely supplementary role, but a central one: it does not justify every restriction, but sets the line beyond which regulation ceases to be legitimate and becomes contrary to the constitutional guarantee of autonomy.

The first element of the proportionality test is the legality of the restriction. In the field of higher education, this requirement assumes particular importance because a substantial part of the practical impact on higher education institutions is exerted not through statutory provisions alone, but through accreditation standards, administrative procedures, subordinate legislation, and individual decisions adopted by accreditation, supervisory, and administrative authorities [2]. Legality therefore requires that the legal framework be sufficiently precise for universities reasonably to foresee when, under what conditions, and with what consequences restrictions upon autonomy may occur [2; 4, pp. 18–27]. Where criteria are indeterminate, grounds for initiating proceedings excessively open-ended, or the scope of autonomy effectively left to by-law elaboration, the first condition of proportionality is not fully satisfied [2; 4, pp. 18–27].

The second element is legitimacy of aim. Restrictions upon autonomy may be justified only if they pursue constitutionally and publicly acceptable aims, such as quality assurance, protection of students, legal certainty of qualifications, legality of operation, academic integrity, rational management of public funds, and transparency of institutional action [2; 4, pp. 7–12]. Yet legitimacy cannot be purely nominal. It is constitutionally impermissible to conceal behind the vocabulary of quality, accountability, or public interest aims that in substance amount to political disciplining of the university, ideological steering of teaching, staffing influence, or indirect subordination of academic decision-making to public authority [1, Arts. 72–73; 3, Art. 13; 5].

The third and fourth elements are suitability and necessity. A measure is suitable only if there is a reasonable connection between the instrument chosen and the aim pursued [4, pp. 18–27; 5]. If a mechanism formally presented as quality assurance does not in fact improve academic standards but primarily expands room for administrative control, it fails even the basic threshold of constitutional justification. Necessity requires more: the same aim must be achievable by a milder measure interfering less with university autonomy [1, Arts. 72–73; 3, Art. 13; 5]. In higher education, this means that preference must be given to corrective measures, time limits for compliance, conditional accreditation, gradual supervision, and other mechanisms that allow deficiencies to be remedied without immediate resort to severe intervention [2; 4, pp. 18–27].

The final stage is proportionality in the strict sense. Here the issue is not whether intervention is legally possible, but whether its cost from the standpoint of constitutional autonomy is acceptable [1, Arts. 72–73; 3, Art. 13; 5]. Even a formally lawful and purpose-oriented measure may remain constitutionally unacceptable if its effects disproportionately burden the institutional independence of the university. This final stage is thus the strongest control of public authority, because it prevents the university from being transformed, under the names of quality, supervision, or financial accountability, into an object of permanent administrative dependence [1, Arts. 72–73; 5].

Applied to accreditation and external quality review, the legitimacy of the aim is not, in principle, disputed. Quality assurance, legal certainty of diplomas, and protection of students are clearly matters of public interest [2; 4, pp. 7–12]. But the constitutional-law acceptability of such mechanisms depends on whether they are structured as professional, clearly regulated, and procedurally reviewable instruments of improvement, or as potentially disciplining tools of public authority [2; 4, pp. 18–27]. The same applies to financing. Budgetary support is legitimate and necessary, but only if it does not create concealed institutional dependence in matters belonging to the university's autonomous sphere [1, Arts. 72–73; 2]. Likewise, digitalisation is not unconstitutional in itself, but is acceptable only if accompanied by guarantees of data accuracy, right of correction, transparency of methodology, reasoned decision-making, and effective legal protection [2; 5].

The general normative conclusion is therefore clear: university autonomy may be restricted, but it must not be normatively emptied [1, Arts. 72–73]. Any restriction is constitutionally acceptable only if it functions as a means of protecting the public interest, and not as an instrument for substituting the will of public authorities for autonomous university decision-making [3, Art. 13; 4, pp. 7–12; 5]. Restrictions are permissible only where they are clearly established by law, directed toward a legitimate aim, suitable, necessary, and proportionate in the strict sense, with particular importance attached to clarity of criteria, duty to state reasons, limitation of discretion, and availability of effective legal protection [1, Arts. 72–73; 3, Art. 13; 5].

7. DE LEGE FERENDA RECOMMENDATIONS

If university autonomy is understood as a constitutionally guaranteed institutional safeguard, then future legislative regulation of higher education must be directed neither toward relativising that guarantee nor toward further expansion of public-law control without clear boundaries [1, Arts. 72–73; 3, Art. 13; 4, pp. 7–12]. On the contrary, de lege ferenda it is necessary to regulate more clearly, more precisely, and more restrictively those mechanisms through which the state may affect the position of higher education institutions, because the greatest risks to autonomy in practice arise not through formal abolition, but through indeterminate criteria, broad discretion, weak reasoning of decisions, and limited legal protection [2; 5].

The first recommendation is that the law should define more expressly the core of university autonomy that must not be subject to free regulatory reshaping [1, Arts. 72–73; 2]. It is not sufficient to list autonomy as a principle; the law should identify more clearly the protected sphere, including internal organisation, selection of teachers and associates according to academic criteria, determination of study programmes, shaping of scientific-research and artistic-research priorities, and adoption of key academic decisions [1, Arts. 72–73; 2; 3, Art. 13]. In these areas, public-law intervention should be reduced to what is necessary for legality, minimum quality standards, and protection of the rights of third parties.

The second recommendation concerns narrowing discretion in accreditation, external quality review, and supervision [2; 4, pp. 18–27]. The law should define more precisely the grounds for extraordinary external review, exclude activation of such mechanisms on the basis of vague assessments, prescribe prior warning and a reasonable time limit for remedying deficiencies whenever the nature of the breach permits, and establish the rule that stricter measures may be applied only if milder measures have proved insufficient [2; 4, pp. 18–27; 5]. Without such gradation, the system may easily shift from professional control to excessive administrative intervention.

The third recommendation requires that decisions be supported by a heightened standard of reasoning. From a constitutional-law standpoint, it is not sufficient that an authority has the power to decide; its decision must be legally and factually reviewable [2; 5]. For that reason, the law should require fuller reasoning for acts affecting accreditation, quality review, financing, enrolment capacities, and other matters impacting autonomy. Such reasoning should include clear statement of relevant facts, specific indication of applied criteria, explanation of why particular arguments were accepted or rejected, and reasons why a milder measure was not sufficient [2; 5].

The fourth recommendation emphasizes the need to ensure effective legal protection. If autonomy is a constitutional guarantee, legal remedies against acts interfering with that sphere must not be merely formal, but substantively effective [1, Arts. 72–73; 5]. The law should more clearly regulate time limits for deciding appeals, suspensive effect where immediate execution would cause difficult-to-remedy consequences, a separate duty to justify urgent intervention, and more intensive judicial review in matters affecting academic and institutional independence [2; 5].

The fifth recommendation concerns the distinction between financial support and financial conditioning [1, Arts. 72–73; 2]. Budgetary financing is legitimate and necessary, but must not become an indirect means of influencing decisions belonging to the autonomous sphere of the university. The law should therefore specify more clearly the criteria for allocation, reduction, and withdrawal of funds, exclude vague financial criteria capable of affecting staffing or programme-related policy, and impose a stricter duty to state reasons for every act affecting financial stability [2; 5].

The sixth recommendation calls for digitalisation and use of data from information systems [2; 5]. The law should expressly regulate the institution's right to full access to data kept about it, the right to correction of inaccurate and incomplete data, the duty of transparency of methodology, and the prohibition of decisions with significant legal consequences where the factual basis cannot be effectively contested [2; 5]. Without such safeguards, digitalisation remains normatively incomplete and potentially dangerous for legal certainty.

The seventh recommendation concerns strengthening the real, rather than merely formal, role of the academic community in decision-making [1, Arts. 72–73; 2]. It is not enough that representatives of the academic community participate in governance bodies if they lack decisive influence in matters belonging to the core of autonomy. The law should therefore more clearly ensure that decisions concerning selection of teachers and associates, study programmes, scientific-research directions, and internal academic policy are determined primarily by academic bodies [1, Arts. 72–73; 2; 3, Art. 13].

In general terms, the future development of the legal framework of higher education should move toward less discretion, greater normative determinacy, stronger procedural guarantees, fuller reasoning, and more effective legal protection [2; 3, Art. 13; 4, pp. 18–27; 5]. Public control should become more lawful, narrower, more predictable, and procedurally fair, while university autonomy must be more precisely protected against both direct and indirect forms of excessive intervention [1, Arts. 72–73; 2; 3, Art. 13; 5].

8. CONCLUSION

The analysis conducted in this paper demonstrates that alignment of the legal framework of higher education in the Republic of Serbia with European Union standards in the field of the constitutional autonomy of universities cannot be reduced to formal adoption of concepts such as autonomy, academic freedoms, quality, and public accountability [2; 3, Art. 13; 4, pp. 7–12]. Legally relevant alignment exists only where those concepts are elaborated in such a way as to provide genuine institutional protection of university independence while simultaneously allowing legitimate, law-bounded, and procedurally controlled public-law regulation [1, Arts. 72–73; 2]. It is at this level that university autonomy emerges not merely as a matter of institutional organisation, but as one of the central questions of the rule of law in the fields of education and scientific research.

The paper's central thesis has been confirmed: university autonomy in the Republic of Serbia has the character of a constitutionally guaranteed institutional safeguard [1, Arts. 72–73]. It is neither a mere declaration nor a principle whose real scope may be freely determined by legislative or administrative convenience [1, Arts. 72–73; 2]. On the contrary, it constitutes a normative limit on state intervention and a legally protected sphere within which the university must retain genuine independence in matters constituting the essence of its academic, organisational, staffing, and programme-related mission [1, Arts. 72–73; 2; 3, Art. 13].

At the same time, European standards support neither a concept of absolutely isolated autonomy nor a model in which the university is reduced to an object of permanent administrative control [3, Art. 13; 4, pp. 7–12; 5]. Article 13 of the Charter and the European quality assurance standards show that academic freedom, institutional independence, public accountability, and quality assurance are compatible only when arranged in a relationship of balance rather than subordination [3, Art. 13; 4, pp. 18–27]. The European standard therefore does not authorise unlimited state penetration into university decision-making in the name of quality or legality, but requires every intervention to be normatively grounded, purposeful, necessary, and proportionate [3, Art. 13; 5].

The current Law on Higher Education, including the 2025 amendments, therefore produces a mixed normative result [2]. It contains elements of significant convergence with European standards: affirmation of autonomy and academic freedoms, strengthening of some mechanisms of procedural protection, broadening of certain material preconditions for institutional functioning, and partial reinforcement of the internal position of the academic community [2]. At the same time, substantive alignment remains incomplete, because certain mechanisms still leave room for broad discretion, insufficiently determinate criteria, intensified supervision, indirect financial conditioning, and digitalised governance without sufficiently developed procedural guarantees [2; 4, pp. 18–27; 5].

The central finding of the paper is that the greatest risk to university autonomy does not necessarily arise from its formal restriction, but from the way in which regulatory mechanisms are normatively structured and institutionally applied [2; 5]. Autonomy may be formally recognised yet materially weakened where criteria are unclear, procedures unpredictable, decisions insufficiently reasoned, and legal remedies only formally available [2; 4, pp. 18–27; 5]. For that reason, the actual degree of alignment of the Serbian system with European standards must be measured not by the number of proclaimed principles, but by the quality of legal elaboration, the limitation of discretion, and the intensity of procedural protection.

The application of the proportionality test confirms that accreditation, external quality review, budgetary financing, and digitalisation are, in principle, legally permissible, but only under strictly determined conditions [1, Arts. 72–73; 3, Art. 13; 5]. A restriction upon autonomy is acceptable only if it is clearly established by law, pursues a legitimate aim, is suitable, is necessary, and does not produce disproportionate weakening of academic and institutional independence [1, Arts. 72–73; 3, Art. 13; 5]. Public-law intervention in higher education cannot therefore be justified merely by invoking quality, legality, or public interest. Such justification has legal force only where accompanied by determinate criteria, predictable procedures, full reasoning, and effective judicial and administrative review [2; 4, pp. 18–27; 5].

The final conclusion is that the Serbian higher education framework is, in principle and to a significant extent, aligned with European standards on constitutional university autonomy, but that such alignment remains incomplete in substantive terms [2; 3, Art. 13; 4, pp. 7–12]. It remains incomplete so long as mechanisms of supervision, accreditation, financing, and digital governance are not more precisely tied to constitutional limits, procedural safeguards, and a stricter standard of proportionality [1, Arts. 72–73; 2; 5]. The further improvement of the system should therefore proceed not through weakening regulation, but through its more precise legal limitation, stronger procedural guarantees, narrower discretion, and clearer statutory protection of the core of university autonomy [2; 4, pp. 18–27].

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УСКЛАЂЕНОСТ ПРАВНОГ ОКВИРА ВИСОКОГ ОБРАЗОВАЊА У РЕПУБЛИЦИ СРБИЈИ СА СТАНДАРДИМА ЕУ У ПОГЛЕДУ УСТАВНЕ АУТОНОМИЈЕ УНИВЕРЗИТЕТА

Резиме: *Рад испитује уставноправни садржај, домашај и границе аутономије универзитета у Републици Србији у контексту интензивиране управноправне регулације високог образовања и европеизације нормативних стандарда. Полазна премиса истраживања заснива се на потреби уравнотежења уставног јемства аутономије универзитета и слободе научног и уметничког стваралаштва са захтевима начела законитости и јавне одговорности у области обезбеђења квалитета, акредитације и финансијског управљања.*

Основна истраживачка питања односе се на: (1) нормативно „језгро“ уставне аутономије; (2) разграничење легитимне јавне контроле од недопуштеног уплитања у академску, организациону, кадровску и финансијску сферу; (3) степен усклађености националног законодавства са европским стандардима у области институционалне независности и обезбеђења квалитета; и (4) критеријуме уставносудске контроле у режиму санкција према високошколским установама.

Методолошки приступ обухвата догматско-нормативну анализу, тумачење релевантних европских докумената и стандарда, компаративно мапирање усклађености, као и примену теста пропорционалности у оквиру захтева владавине права, правне извесности и предвидљивости санкција.

Резултати истраживања указују на висок степен принципијелне конвергенције између националног и европског нормативног оквира, али и на структурне изазове у институционалном дизајну система акредитације и у предвидљивости санкционих механизама. Ови налази имају непосредне импликације на заштиту академске слободе и демократску функцију универзитета, те доприносе теоријском разјашњењу уставног језгра аутономије у условима европеизације високог образовања.

Кључне речи: *уставна аутономија универзитета, академска слобода, начело законитости, владавина права, обезбеђење квалитета, акредитација, пропорционалност, европеизација*

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EUROPEAN CHARTER ON LOCAL SELF-GOVERNMENT: STANDARDS AND PRACTICAL APPLICATION

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Abstract: *Local self-government is considered one of the foundations of European democracy. The importance of local self-government in Europe is not only administrative, but also political and social, and is based on the fundamental principle that decisions should be made as close as possible to citizens. Without strong local self-government, the state itself becomes centralized, which leads to greater bureaucracy and alienation of citizens from political decision-making, i.e. from the opportunity to directly participate in the conduct of local government affairs. The most important elements on which local self-government in Europe is based are subsidiarity and financial autonomy. The European Charter of Local Self-Government, adopted in 1985 under the auspices of the Council of Europe, is the first binding international treaty dedicated to protecting the autonomy of local authorities. The European Charter establishes common standards for political, administrative and financial independence, thereby placing local self-government at the very heart of democratic governance. Through this text, we analyze the historical context, key principles, legal structure and oversight mechanisms in the practical application of this important act, emphasizing its central role in shaping and improving local democracy and Europe as a whole, with a special focus on the Republic of Serbia. The European Charter of Local Self-Government represents more than a simple proclamation of certain principles. Indeed, the European Charter is a fundamental, binding legal instrument that has significantly shaped the understanding and practice of local democracy in contemporary Europe. By combining strong principles (such as subsidiarity and financial autonomy) and a flexible binding mechanism, the European Charter has gained widespread acceptance across European countries. The aim of this paper is to provide a comprehensive analysis of the standards established by the European Charter and to examine how they protect local democracy. Particular attention is devoted to identifying the areas in which the Republic of Serbia is fully aligned with these standards, as well as those in which legal gaps remain and further improvements are required.*

Keywords: *local self-government, European Charter, Council of Europe, local authorities, decentralization, centralization, Republic of Serbia, ratification, financing, governance*

1. INTRODUCTION

Local self-government is a crucial part of a modern democratic system, enabling citizens to participate, directly or through their elected representatives, in decision-making on affairs and other important issues of local importance. In response to the need for unified standards in this area, the Council of Europe adopted the European Charter of Local Self-Government in 1985 [1] (hereinafter: the European Charter), which has become a principal legal framework for regulating relations between central and local authorities on the European continent. This act is of particular importance in the context of European integration, as it represents the legal framework that candidate countries for membership of the European Union must implement in their national legislation. By ratifying the European Charter in 2007 [2], the Republic of Serbia undertook to harmonize its legal system with European standards in the field of local democracy. The monitoring mechanisms, in particular the work of the Congress, facilitate continuous dialogue and a stimulus for further reforms. The European Charter continues to serve as an indispensable starting point for all discussions on decentralisation, strengthening the potential of local authorities and deepening democracy.

This is the most important European document in the field of local self-government. It confirms the thesis that democracy is most thoroughly realised at the local level, and therefore establishes the fundamental principles on which it must be based, such as the legal protection of local self-government and the right to its own sources of income.

2. HISTORICAL DEVELOPMENT AND THE ORIGINS OF THE CHARTER

The idea of creating a universal document that would regulate local self-government at the European level emerged as the fruit of many years of work by the Council of Europe. The key steps towards this goal were the Declaration on Local Self-Government of 1968 and Council of Europe Resolution No. 126 of 1981 [3]. The aforementioned Resolution was of particular importance because it provided for the first draft of an legally binding international instrument in this field. After thorough consultations and preparations, the European Charter of Local Self-Government was finally adopted in Strasbourg on 15 October 1985 [4], and entered into force on 1 September 1988. It is the result of many years of efforts by the then Standing Conference of Local and Regional Authorities of Europe, the the predecessor of the current Congress of Local and Regional Authorities of the Council of Europe. The Charter has been ratified by all member states of the Council of Europe without exception, confirming its universal acceptance as a common European standard. For the signatory states, the Charter is a binding international treaty, which obliges them to bring their legislation and practice into line with its principles, which in practice implies that the fundamental principle of local self-government is recognised and implemented in domestic legislation, and if possible in the constitution itself as the supreme legal act of each state. It is very important to emphasize that the adoption of the European Charter was preceded by the activity of the then Conference of Local and Regional Authorities, which was institutionalised and transformed into the Congress of Local and Regional Authorities of Europe in January 1994 [5]. This body today plays a major role in monitoring the implementation of the European Charter and promoting local democracy in the member states of the Council of Europe.

By signing this document, Council of Europe member states sought to achieve greater unity of the Council of Europe wanted to achieve greater unity in preserving and implementing the fundamental principles that form the basis of the Charter and their common heritage. By adopting the Charter, the member states of the Council of Europe wanted to contribute to the improvement of local self-government and the principles of democracy and decentralization. All these concepts are highlighted in the preamble itself, which is which is written in a formal and declarative tone. The Charter defines local self-government as one of the essential parts of the materiae constitutionis [6].

The adopted principles have improved local self-government systems, especially in the countries that were socialist in Central and Eastern Europe, and the principles themselves are the minimum European standard that makes a democratic society in the field of local government law [7].

3. STRUCTURE AND KEY PRINCIPLES OF THE EUROPEAN CHARTER OF LOCAL SELF-GOVERNMENT

The essence of the European Charter is contained in Article 3, which defines local self-government as the right and ability of local authorities to, within the framework of the law, regulate and manage a substantial part of their public affairs under their own responsibility and in the interests of their local population.

The European Charter of Local Self-Government consists of three main parts [8]. The first part establishes the general principles of local self-government, the second part deals with the supervision of the work of local authorities, and the third part contains provisions on the implementation of the Charter.

Within the first part, the Charter formulates local self-government as "the right and ability of local authorities to, within the framework of the law, regulate and manage certain public affairs under their own responsibility in the interests of their local population"[9]. This definition emphasizes two basic principles: the autonomy of local authorities and their accountability to the local population.

The European Charter establishes several essential principles that constitute standards for the functioning of local self-government:

1) Constitutional and legal basis – the principle of local self-government must be recognized in the constitution or fundamental law of the state [10];
2) Autonomy of local authorities – local authorities must have genuine autonomy to make decisions to take decisions and manage the affairs within their competence without unnecessary intervention by central authorities [11]. The European Charter stipulates that public affairs are primarily carried out by the authorities closest to the citizen. The transfer of responsibilities to a higher level is acceptable only if the performance of the task at a lower level is less efficient or impossible. Accordingly, local authorities have the right to shape their internal administrative structure. The supervision of the central authorities over their work is limited only to the verification of legality and must be carried out in a manner prescribed by the constitution or law, thus protecting the decisions of local authorities from unjustified interference in the assessment of expediency.
3) Financial autonomy - local authorities should have appropriate and proportionate sources of revenue, as well as the right to determine tax rates within the framework determined by law [12]; In order for local authorities to be able to effectively carry out their tasks, they must have adequate financial resources of their own. The European Charter requires that the revenues of local authorities be proportionate to their powers, that they have the right to specify, within the law, the rates of individual local taxes and that the system of financial assistance from the central government must not be used to jeopardise their discretionary decision-making rights.
4) Right to association – local authorities have the right to cooperate with each other and to form associations with other local authorities for the purpose of carrying out tasks of common interest [13];
5) Protection of territorial boundaries – the territorial boundaries of local units cannot be changed without prior consultation of citizens or holding a referendum [14].

4. LEGAL STRUCTURE AND METHOD OF OBLIGATION

One of the most important features of the European Charter is its flexible "à la carte" system of obligations. Although states must ratify the entire European Charter, they are obliged to implement at least 20 provisions from Part I, of which at least 10 must be from the so-called "hard core". This important set of provisions includes provisions guaranteeing a constitutional and legal basis (Art. 2), a definition of self-government (Art. 3), subsidiarity (Art. 4), the right to consultation (Art. 4, paragraph 6), border protection (Art. 5), financial resources (Art. 9) and legal protection (Art. 11). This system has enabled wide ratification while respecting the different national systems.

In 2009, the Additional Protocol on the right to participation in the affairs of local authorities was adopted, which goes into details relating to citizens' rights to information, consultation and direct participation in decision-making. The Additional Protocol has been in force since 1 June 2012.

In addition to the fact that the European Charter applies primarily to the member states of the Council of Europe, its principles have been accepted in the organisation and functioning of local self-government in other countries as well, which is in line with the integration processes in Europe, and the principles themselves are broadly stated to be able to be applied by all states, regardless of differences in their historical, traditional and other circumstances [15].

4.1 Legal nature and protection mechanisms

Although the European Charter is not directly applicable in all national legal systems, its legal nature as an international treaty includes the obligation of the signatory states to implement its provisions in their legislation. What is special about the European Charter is that it does not dictate a single model of local self-government, but rather respects the different legal traditions and political systems of the member states [16]. This flexibility has enabled the European Charter to be ratified by 47 member states of the Council of Europe, making it the most widely accepted instrument in the field of local democracy.

The instruments for protecting the right to local self-government provided for in the European Charter include:

- the right of local authorities to legal remedies to ensure the free exercise of their tasks [17];
- the limitation of administrative supervision exclusively to the review of constitutionality and legality [18];
- the prohibition of the dissolution of local councils without a procedure provided for by law and the obligation to restore their functioning as soon as possible [19].

4.2 Monitoring mechanisms and implementation

The monitoring of the implementation of the European Charter is systematic and comprehensive. The Congress of Local and Regional Authorities of the Council of Europe plays a central role, monitoring local and regional democracy in all member states. The Congress organises monitoring missions, transfers good practice and publishes reports assessing the coherence of national legislation and practice with the European Charter. As an expert support, the Congress has at its disposal the Group of Independent Experts on the European Charter, a body composed of leading academics.

In addition, a specialised online database, "Carta-Monitor", has been established, which provides everyone with access to a detailed analysis of the European Charter by article for each individual state, as well as comparative analyses between countries. This tool helps researchers, activists and decision-makers to monitor progress in implementation.

5. IMPACT OF THE CHARTER ON THE LEGISLATION OF THE REPUBLIC OF SERBIA

By ratifying the European Charter in 2007 [20], the Republic of Serbia committed itself to aligning its legislation with its standards. This process was finalized with the adoption of the Law on Local Self-Government in 2007 [21], which epresents a significant step towards strengthening local self-government in Serbia.

The Constitution of the Republic of Serbia also contains provisions that are in line with the European Charter. Namely, Article 12 of the Constitution of the Republic of Serbia defines that state power is limited by the "right of citizens to provincial autonomy and local self-government", while Article 176 guarantees citizens the right to local self-government, which is subject only to the control of constitutionality and legality [22]. This constitutional regulation reflects a substantial shift from the previous Constitution of the Republic of Serbia from 1990, which did not provide adequate protection for local self-government [23].

However, problems arise in practice in the application of the standards of the European Charter. The most significant challenges include:

- financial dependence of local units on the state [24];
- inadequate demarcation of competences between central and local authorities [25];
- limitation of the normative autonomy of local authorities [26].

5.1 Mandatory provisions of the European Charter and ratification by the Republic of Serbia

When ratifying the European Charter, each Contracting State must undertake to accept at least twenty paragraphs of the provisions that make up Part One of the European Charter (out of a total of thirty, which is two-thirds of the total number), at least ten of which must be chosen from among the precisely defined paragraphs [27] that constitute the "hard core" of the European Charter, which are contained in the following articles:

- Article 2
- Article 3, paragraphs 1 and 2
- Article 4, paragraphs 1, 2 and 4
- Article 5
- Article 7, paragraph 1
- Article 8, paragraph 2
- Article 9, paragraphs 1, 2 and 3
- Article 10, paragraph 1
- Article 11 [28].

Each Contracting State, when acceding to or accepting the European Charter, shall notify the Secretary General of the Council of Europe of the the provisions it has accepted in accordance with the provisions of paragraph 1 of this Article. Serbia, in accordance with paragraph 2, has notified the Secretary General of the Council of Europe of the positions it has accepted. By counting the positions accepted by Serbia (a total of 24 positions, including all 10 mandatory "hard core" positions), Serbia has fulfilled the minimum requirements, which demonstrates a strong commitment to the principles of local self-government.

When depositing its ratification, the Republic of Serbia, in accordance with Article 12 of the European Charter, made a declaration by which it undertook to accept the following provisions:

- Article 2 – Constitutional and legal basis of local self-government.
- Article 3, paragraphs 1 and 2 – Concept of local self-government (right and capacity of local authorities to regulate their affairs, freely elected councils).
- Article 4, paragraphs 1, 2, 4 and 6 – Scope of local self-government (basic powers, freedom of initiative, consultation of local authorities).
- Article 5 – Protection of local authority boundaries (obligation to consult before changing boundaries).
- Article 7, paragraphs 1 and 3 – Conditions for exercising powers (free exercise of functions and incompatibility of functions).
- Article 8, paragraphs 1 and 2 – Administrative supervision (exercised only in accordance with the Constitution and law).
- Article 9, paragraphs 1, 2, 3, 4, 5, 6, 7 and 8 – Financial resources (right to own resources, local taxes, access to the capital market).
- Article 10, paragraph 1, 2 and 3 – Right to association (cooperation, consortia and international cooperation).

- Article 11 – Local authorities (right to appeal to the court) [29].

In this way, the obligation of the Republic of Serbia under the European Charter has been specified, respecting the flexibility granted to the contracting states to choose the minimum number of provisions to which they will be considered bound, including the mandatory "hard core" provisions. The Republic of Serbia has accepted almost all the provisions of Article 9 of the European Charter, and the Law on the Financing of Local Self-Government [30] is a key instrument for their implementation.

By ratifying the European Charter, the Republic of Serbia has formally accepted the essential European standards in the field of local democracy and decentralization. An analysis of the key domestic legal acts of the Constitution of the Republic of Serbia, the Law on Local Self-Government, the Law on the Financing of Local Self-Government and the Law on Territorial Organization of the Republic of Serbia indicates that the legal order of the Republic of Serbia is to a significant extent aligned with the international obligations undertaken.

In this analysis, it is important to note that the Republic of Serbia has not made a declaration of acceptance of the following provisions from Part I of the European Charter:

- Article 4, paragraph 3 – Principle of subsidiarity (performance of tasks as closely as possible to the citizen).
- Article 4, paragraph 5 – Adaptation of delegated powers to local conditions.
- Article 6, paragraph 1 – Independent determination of the internal administrative structure.
- Article 6, paragraph 2 – Conditions of service and promotion of employees in local self-government.
- Article 7, paragraph 2 – Financial compensation and social security for elected representatives.
- Article 8, paragraph 3 – Proportionality of administrative supervision [31].

The Law on the Ratification of the European Charter of Local Self-Government does not contain any justification or explanation as to why certain articles or provisions of the European Charter were not accepted.

Constitutional guarantees, the definition of original competences according to the principle of subsidiarity, an established financing system that seeks to ensure adequacy and autonomy, a procedure for changing borders that includes prior consultation of citizens through a referendum, as well as strong mechanisms of legal protection before the Constitutional Court and the Administrative Court, represent a concrete realization of the principles of the European Charter. In addition to the fact that in practice there may be challenges in the application of these norms, the legislative framework provides a reliable basis for the further development and strengthening of local self-government in the Republic of Serbia, in accordance with its international positions.

6. ADDITIONAL PROTOCOLS AND RELATED DOCUMENTS

The progress of local self-government standards at the European level was further enhanced by the adoption of the Additional Protocol to the European Charter of Local Self-Government on the right to participate in the affairs of local authorities, adopted by the Council of Europe in 2009 [32]. This Protocol prescribes the mechanisms of involving citizens in decision-making processes at the local level, in particular through direct participation of citizens in the conduct of local self-government affairs (direct democracy), including referendums, citizens' initiatives and referendums [33]. The Republic of Serbia has not ratified this Additional Protocol to date [34], which is an obstacle to the full harmonisation of national legislation with European standards.

However, it is important to note that in 2021, the Republic of Serbia adopted a special Law on Referendum and People's Initiative [35], which specifically regulated the implementation of these institutions. With the adoption of this law, the provisions of the Law on Local Self-Government and the Law on the Capital City that relate to local referendums [36] ceased to apply.

Other significant instruments in this field are:

- European Urban Charter [37] - focuses on the specific problems of urban environments and the rights of citizens in cities.
- World Charter on Local Self-Government (UN-Habitat) [38] - this document sets global guidelines for decentralization. It was developed under the auspices of the United Nations in order to apply the principles of local autonomy beyond the borders of Europe.
- Recommendations of the Congress of Local and Regional Authorities [39] - The Congress is a Council of Europe body that regularly monitors the state of local democracy in each member state. Their reports and recommendations have great political authority and often serve as a basis for legal reform in a country that is "lagging behind" in implementing standards.
- European Strategy for Innovation and Good Governance at Local Level (2008) [40] - introduces 12 principles of good governance, including the rule of law, efficiency and transparency.

7. CONCLUSION

The European Charter of Local Self-Government represents a fundamental instrument of great importance in the development of local democracy on the European continent. Its importance is reflected not only in the determination of general standards, but also in the promotion of the understanding of local self-government as a crucial condition for the functioning of modern democracy. Since its adoption, the European Charter has had a significant impact on the legislation of numerous European countries, including the Republic of Serbia. It provides a standard framework that defines the minimum rights and freedoms that local authorities must have in every democratic society.

The European Charter is implemented in the Law on Local Self-Government through the direct incorporation of its basic principles, such as the autonomy of local authorities, financial independence and protection from interference by higher authorities, which is largely aligned with the European Charter. However, there are also certain differences, especially in the scope of autonomy, financing and the level of constitutional protection, where the law allows for greater central supervision than the European Charter recommends.

In Serbia, the implementation of the European Charter is monitored primarily by republican authorities through the review of the legality of local acts, as well as by courts for the protection of autonomy, in accordance with the Law on Local Self-Government.

Although Serbia has ratified the European Charter and adopted laws that formally align it with its provisions, significant work still needs to be done at the level of practical implementation. Special attention must be paid to strengthening the financial autonomy of local units, expanding their normative independence and enabling more effective participation of citizens in local governance. Only through the full harmonization of national practice with the standards of the European Charter will local self-government in the Republic of Serbia be able to fulfill its fundamental role, i.e. continue to be an instrument through which citizens directly shape the quality of their daily lives.

The Republic of Serbia is still working on full decentralization (especially in terms of real financial power at the local level), and the European Charter serves as a control mechanism, through its working bodies.

Although the European Charter has established a strong legal foundation, its further effectiveness depends solely on the willingness of states to ensure both formal and substantive implementation through forms of financial and administrative independence, which would make local authorities real carriers of development, capable of responding to all the demands and needs of their community in accordance with modern European and other international standards.

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ЕВРОПСКА ПОВЕЉА О ЛОКАЛНОЈ САМОУПРАВИ: СТАНДАРДИ И ПРАКТИЧНА ПРИМЕНА

Резиме: *Локална самоуправа се сматра једним од темеља европске демократије. Важност локалне самоуправе у Европи није само административна, већ политичка и друштвена, а заснива се на основном принципу који се одлукује у томе да се одлуке доносе што је могуће ближе грађанима. Без снажне локалне самоуправе, сама држава постаје централизована, што води у правцу веће бирократије и отуђењу грађана од политике, односно од могућности да непосредно учествују у обављању послова локалне самоуправе. Најважнији елементи на којима почива локална самоуправа у Европи представљају супсидијарност и финансијска аутономија. Европска повеља о локалној самоуправи, која је усвојена 1985. године под окриљем Савета Европе, представља први обавезујући међународни уговор посвећен заштити права на аутономију локалних власти. Европска повеља утврђује заједничке стандарде за политичку, административну и финансијску независност, чиме локалну самоуправу поставља у сам фокус демократског управљања. Кроз овај текст анализирамо историјски контекст, кључне принципе, правну структуру и механизме надзора у практичној примени овог важног акта, истичући пре свега његову интензивну улогу у обликовању и унапређењу локалне демократије и Европи широм ње, са одређеним посебним освртом на Републику Србију. Европска повеља о локалној самоуправи репрезентује нешто више је од обичне прокламације одређених начела. Наиме, Европска повеља је основни, обавезујуће правно средство које је значајно обликовало разумевање и праксу локалне демократије у савременој Европи. Комбинацијом чврстих начела (као што су супсидијарност и финансијска аутономија) и флексибилног механизма обавезивања, Европска повеља је постигла изузетно широко прихватање у практичној примени Европских земаља. Циљ рада је свеобухватна анализа стандарда које поставља Европска повеља и начина на који они штите локалну демократију, уз могућност идентификације делова где је Република Србија потпуно усклађена и делова где још увек постоје правне празнине и могућност унапређења стандарда и поступања.*

Кључне речи: *локална самоуправа, Европска повеља, Савет Европе, локална власт, децентрализација, централизација, Република Србија, ратификација, финансирање, управљање*

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CORRUPTION OF POLICE OFFICERS AS A FACTOR OF ORGANIZED CRIME

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Abstract: *Corruption among police officers represents one of the most significant factors enabling the development, functioning, and long-term maintenance of organized crime. In contemporary conditions, it does not represent solely individual deviant behavior but rather acquires the characteristics of a systemic phenomenon acting as a functional mechanism that connects criminal structures with state institutions.*

The subject of this paper is the analysis of the functional role of corruption within police structures in the context of organized crime, with the aim of indicating the ways in which corrupt police officers contribute to the formation, protection, and stabilization of organized criminal groups. The paper is based on theoretical, normative, institutional, and empirical analysis, with particular attention devoted to the criminal-law framework for the incrimination of corruption-related offenses, as well as to institutional mechanisms for controlling police work.

In this context, preventive measures such as internal control, the strengthening of integrity and ethical standards, as well as repressive measures, including criminal investigations, prosecution, and sanctioning of corrupt officials, are considered. It is concluded that the effective suppression of organized crime is impossible without a systemic and consistent fight against corruption within the police.

Keywords: *corruption, police officers, organized crime, preventive measures, repressive measures, institutional integrity*

INTRODUCTION

Corruption represents one of the most significant security and social challenges of contemporary states, particularly in the context of its connection with organized crime. Although it is most commonly defined as the abuse of public power for the purpose of obtaining personal benefit, in contemporary conditions it goes beyond the framework of individual deviant behavior and acquires the characteristics of a systemic phenomenon that undermines the institutional order and the rule of law [1, p. 42].

Corruption within police structures is of particular gravity, as it directly affects the effectiveness of criminal-law protection. Organized criminal groups strive to establish stable connections with holders of public authority in order to secure access to information, avoid prosecution, and ensure the continuity of illegal activities [2, p. 117]. In this context, corruption does not operate merely as an accompanying phenomenon, but as a functional mechanism integrating criminal activities into institutional structures [3, p. 89].

From the perspective of criminal law, corruption-related offenses committed by police officers include abuse of office, giving and receiving bribes, trading in influence, disclosure of official secrets, and obstruction of justice, all of which are criminalized under both national legislation and international instruments [4, p. 203]. It is particularly significant that international standards recognize corruption of public officials as one of the key preconditions for the development and functioning of organized crime [5, pp. 13–14].

Building on this foundation, the subject of this paper is the analysis of corruption among police officers as a factor in organized crime. The aim is to identify the mechanisms through which corruption within the police contributes to strengthening criminal structures and to highlight the importance of preventive and repressive measures in its suppression. The study is based on an analysis of relevant literature, legal regulations, and empirical data from the Internal Control Sector of the Ministry of the Interior of the Republic of Serbia.

1. THE CONCEPT AND FORMS OF POLICE CORRUPTION IN THE CONTEXT OF ORGANIZED CRIME

Corruption, as a social phenomenon, represents a complex and multidimensional concept, which significantly complicates its uniform and generally accepted definition. In contemporary societies, there is a wide range of interpretations of this notion, while certain forms of corrupt behavior are classified differently depending on the legal and institutional framework of a particular state [6, pp. 31–32]. This issue becomes even more pronounced in the field of police activity, particularly in the context of its connection with organized crime, where corruption assumes more complex, concealed, and functionally significant forms.

In academic literature, corruption is approached from different perspectives. From a legal standpoint, it is most commonly defined as unlawful conduct, i.e., the abuse of official position for the purpose of obtaining benefit. From an ethical perspective, corruption represents a deviation from moral norms and values, while in a sociological sense it is treated as a form of social deviance that undermines trust in institutions [7, p. 45]. Starting from the concept of deviant behavior within the police, Kesić points out that corruption may be understood as a violation of legal and ethical norms governing police conduct [8, pp. 134–150].

Given the multidimensional nature of this phenomenon, two basic approaches to defining police corruption are distinguished in theory. The narrow approach limits corruption to the abuse of official position for the purpose of obtaining personal gain, with bribery being its most typical form. In contrast, the broader approach encompasses any form of abuse of police powers, regardless of the existence of material gain, thereby linking corruption to a wider spectrum of unlawful and unethical behavior [Ibidem].

Of particular importance in the context of organized crime is the understanding that corruption of police officers represents a specific form of criminal behavior integrated into institutional structures, which enables the uninterrupted functioning of organized criminal groups. In this sense, it includes not only bribery, but also obstruction of criminal prosecution, disclosure of confidential information, and other forms of abuse of official powers [1, p. 43]. Such a functional understanding indicates that corruption transcends the framework of individual deviance and becomes a mechanism of support for criminal structures.

Classifications of police corruption further contribute to understanding its complexity. One of the most commonly cited divisions distinguishes petty, bureaucratic, criminal, and political corruption [9, p. 3]. In the context of organized crime, criminal corruption is particularly significant, as it implies continuous cooperation between police officers and criminal groups through the provision of protection, information, and facilitation of illegal activities. Additionally, the distinction between petty and grand corruption indicates that grand corruption, associated with holders of institutional power, has the greatest impact on the stability and persistence of organized crime.

From the perspective of the role of the police officer, a distinction is made between reactive and proactive corruption. Reactive corruption implies the acceptance of an already offered benefit, while proactive corruption includes situations in which the officer initiates corrupt activity [10, p. 23]. This division is further elaborated in the typology of "grass-eaters" and "meat-eaters," which points to different levels of involvement of officers in corrupt practices [11, p. 50]. In this context, corrupt behavior may be observed as a process of gradual escalation of deviant conduct [12, p. 103].

According to the degree of organization, corruption may be opportunistic or organized. While the former occurs sporadically, the latter implies continuous and pre-arranged relationships between police officers and criminal structures [13, p. 16]. In extreme cases, such relationships evolve into systemic corruption, which becomes part of institutional practice and leads to the erosion of institutional integrity [14, p. 299].

A particularly dangerous form is institutionalized corruption, in which corrupt mechanisms become established patterns of conduct within institutions. It enables organized criminal groups to secure long-term protection, stability, and the legitimization of illegal activities, including money laundering through legal financial flows [4, pp. 195–215]. Under such conditions, the boundary between lawful and unlawful conduct becomes blurred, which represents a serious threat to the rule of law.

2. THE ROLE OF CORRUPTION IN THE PROTECTION AND FUNCTIONING OF ORGANIZED CRIME

Starting from the previously presented theoretical definitions and classifications of police corruption, it can be observed that this phenomenon, in the context of organized crime, goes beyond the framework of individual deviant behavior and acquires the character of a structural mechanism that directly affects the functioning of criminal organizations. In this sense, corruption becomes a means of linking institutional structures with organized criminal groups, thereby acquiring its full criminological and security dimension.

In contemporary conditions, it manifests itself through stable and long-term relationships between police officers and criminal actors, based on continuous and pre-arranged arrangements aimed at ensuring the uninterrupted performance of illegal activities. In this way, corruption becomes a functional precondition for the survival of organized crime, and in practice it is manifested through the establishment of a parallel system of "protection," in which holders of public authority effectively ensure the impunity of criminal groups, thereby distorting the fundamental function of the police. Empirical research indicates that this phenomenon may take organized forms, including systematic cooperation between certain police officers and criminal groups [15, p. 436].

The dynamics of these relationships show that the initiative may originate both from criminal groups and from police officers themselves. While criminal actors seek to secure the safety of their activities through corruption, certain officers recognize in it an opportunity to obtain benefit, whereby in some cases this relationship evolves into an active phase of abuse of powers. It is precisely this transformation that marks the transition from individual corruption to its structural integration into criminal flows, as officers become an integral part of criminal networks, placing institutional power at the service of criminal interests.

The functioning of such a system implies organization, coordination, and division of roles, including the identification of profitable activities, the establishment of communication channels, and the distribution of illegally obtained benefits [16, p. 432]. This level of organization indicates the existence of internal corrupt networks within police structures, which represents a key distinction from classical forms of corruption.

A particular risk arises in areas of highly profitable crime, such as trafficking in narcotics, weapons, and human beings, where strong financial motives encourage the establishment of such relationships. In the context of transnational crime, this risk is further intensified, as it involves multiple states and complex mechanisms of coordination.

An additional dimension is represented by the engagement of police officers in private security activities, especially when they are linked to criminal structures. Although formally lawful, such activities may lead to conflicts of interest and undermine institutional integrity [17, pp. 25–50], whereby criminal actors exploit access to information and resources possessed by the officers.

Viewed as a whole, the protection of criminal activities by police officers represents one of the most destructive forms of corruption, as it enables the formation of parallel structures within institutions and leads to the erosion of the rule of law. Therefore, effective counteraction to this phenomenon is possible only through an integrated approach that includes strengthening internal control, integrity mechanisms, and the consistent application of criminal law sanctions.

3. NORMATIVE AND INSTITUTIONAL FRAMEWORK IN COMBATING CORRUPTION OF POLICE OFFICERS IN THE REPUBLIC OF SERBIA

Effective combating of corruption among police officers, particularly in the context of organized crime, requires the existence of a clearly defined and functionally interconnected normative and institutional framework. This framework includes both repressive and preventive mechanisms, encompassing criminal law, procedural, disciplinary, and ethical instruments, which enable the timely detection, proving, and sanctioning of corrupt conduct. In the legal system of the Republic of Serbia, this area is regulated through the synergy of international anti-corruption standards and domestic legislation, indicating the legislator's intention to establish a comprehensive system for countering this phenomenon.

The Republic of Serbia has ratified key international instruments in the field of anti-corruption, among which the United Nations Convention against Corruption occupies a prominent place, as well as the Council of Europe conventions, which recognize corruption as a serious threat to the rule of law and institutional integrity. Within the national legal framework, the Criminal Code holds a central position, criminalizing abuse of office, trading in influence, as well as giving and receiving bribes [1, Arts. 359, 366, 367, 368 CC]. These criminal offenses constitute the normative core of anti-corruption efforts, but in practice they often occur concurrently with other forms of criminality, particularly within organized criminal structures, where they are functionally connected with offenses such as money laundering or disclosure of official secrets. Of particular importance is also the criminal offense of association for the purpose of committing criminal offenses, which enables the sanctioning of organized criminal groups, including situations in which corrupt police officers become their integral members [1, Art. 346 CC].

Procedural mechanisms for detecting and proving corruption-related criminal offenses are regulated by the Criminal Procedure Code, which provides for the application of special evidentiary actions in situations where evidence cannot be obtained in another manner or where such obtaining would be significantly impeded. These measures include covert surveillance of communications, covert monitoring and recording, simulated business operations, computer data searches, controlled delivery, and the engagement of an undercover investigator, and they are of particular importance in cases related to organized crime, given the highly conspiratorial nature of such structures [2, Arts. 166, 171, 174, 178, 181, 183 CPC]. Additional institutional support is provided by the Law on the Organization and Competence of State Authorities in

Suppressing Organized Crime, Terrorism, and Corruption, which established a system of specialized prosecution offices and court departments, thereby enabling the concentration of expert and operational capacities in handling complex cases [3, Arts. 5, 6, 7].

A special role in the system of prevention and detection of corruption is played by the Law on Police, which regulates mechanisms for controlling the work of police officers. In this context, the Internal Control Sector represents a key institutional mechanism, whose function is directed both toward detecting unlawful conduct and preventing corruption risks [4, Arts. 222–233 LOP]. In accordance with its competences, this sector conducts integrity tests, corruption risk analyses, monitoring of asset declarations and changes in property status of employees, as well as internal controls in cases of suspected unlawful conduct. These mechanisms have a pronounced preventive character, as they enable the early detection of potential abuses and the prevention of their further development, indicating that the fight against corruption cannot be based solely on repression, but must also include systemic preventive instruments [4, Arts. 230, 233a, 230b, 230v LOP].

The broader anti-corruption framework is complemented by the Law on the Prevention of Corruption, which regulates issues of conflict of interest and asset control, thereby contributing to strengthening the integrity of the public sector [5, Art. 6 LPC]. Of particular importance in combating organized crime is the Law on the Seizure of Proceeds from Crime, which enables the deprivation of perpetrators of unlawfully acquired assets, directly targeting the economic basis of criminal activities [6, Art. 6 LSPC]. An additional mechanism is the Law on the Protection of Whistleblowers, which ensures protection for persons reporting corruption and thereby contributes to the detection of hidden forms of unlawful conduct [7, Arts. 2, 5, 10, 12].

At the strategic level, the fight against corruption is defined by the National Strategy for the period 2024–2028, which emphasizes the importance of prevention, institutional cooperation, and strengthening integrity [8, pp. 17–38]. Although the normative framework of the Republic of Serbia is largely aligned with international standards and formally well established, its actual effectiveness depends on consistent implementation. In my opinion, the key value of this system lies in the integration of repressive and preventive mechanisms, while the greatest challenge is reflected in their practical application, as without consistent and non-selective enforcement, even the most developed normative framework cannot ensure the expected results in combating corruption linked to organized crime.

4. ANALYSIS OF THE RELATIONSHIP BETWEEN POLICE CORRUPTION AND ORGANIZED CRIME

Corruption of police officers represents one of the key mechanisms that enable the development, stability, and adaptation of organized crime to the institutional environment of the state. Unlike conventional forms of criminality, organized criminal groups strive for long-term operation and the minimization of the risk of criminal prosecution; therefore, the establishment of corrupt relationships with holders of public authority, particularly police officers, constitutes one of the fundamental preconditions for their functioning.

In practice, corrupt police officers provide criminal groups with access to confidential information regarding investigations, operational activities, and surveillance measures, thereby enabling members of organized criminal groups to avoid police interventions, adapt their methods of operation, and conceal evidence. In addition, corruption enables protection from prosecution, delays or redirection of investigations, as well as the misuse of institutional resources for the purpose of concealing illegal activities. In this way, it operates as an intermediary mechanism between the lawful institutional sphere and criminal activity, contributing to the formation of parallel power structures within institutions.

A particularly dangerous form is criminal corruption, which implies continuous cooperation between police officers and criminal groups. In such relationships, officers not only tolerate illegal activities but, in certain cases, actively participate in their execution, with unlawfully obtained benefits being shared among the actors. In more complex situations, police powers are abused as an instrument of criminal competition, further deepening the criminalization of institutional functions.

One of the most dangerous forms of this relationship is so-called "insider" corruption, which occurs when criminal groups succeed in exerting influence within the institutional system, particularly at the operational and decision-making levels. Under such conditions, organized crime acquires the capacity to influence the course of investigations, access to evidence, and decisions of prosecutorial authorities from within. At the same time, stable networks of corrupt officials are formed, enabling coordinated and long-term criminal activity while reducing the risk of detection [4, p. 112].

The consequences of such phenomena are multiple. At the institutional level, there is a decline in the effectiveness of police actions, the compromise of investigations, and the weakening of control mechanisms, while at the societal level there is a decline in public trust in state authorities and a weakening of the rule of law [3, pp. 78–81]. If corruption acquires a systemic character, it may lead to deep criminalization of institutions and the blurring of the boundary between lawful and unlawful conduct.

Empirical data from the Internal Control Sector of the Ministry of the Interior of the Republic of Serbia confirm these findings, indicating an increasing involvement of police officers in organized criminal structures. These data suggest that corruption is not an isolated phenomenon, but rather a structural element of criminal systems, in which police officers, in certain cases, become active participants in criminal activities.

At the international level, corruption of police officers has been recognized as one of the key factors in the development of organized crime, which is why particular emphasis is placed on strengthening internal control, transparency, and institutional integrity [4, pp. 21–33]. These standards indicate that an effective fight against organized crime is not possible without the simultaneous suppression of corruption within the bodies responsible for its detection.

5. ANALYSIS OF EMPIRICAL RESULTS AND DISCUSSION ON THE RELATIONSHIP BETWEEN POLICE CORRUPTION AND ORGANIZED CRIME

Empirical data from the Internal Control Sector of the Ministry of the Interior of the Republic of Serbia for the period 2017–2022 indicate a high level of correlation between police corruption and organized crime. The analysis includes the number of filed criminal complaints, the structure of criminal offenses, and the categories of perpetrators, enabling a comprehensive understanding of the dynamics and manifestations of this phenomenon. The particular significance of these data lies in the fact that they indicate the transformation of corruption from individual deviant behavior into a structural element of organized criminal activity.

For the purpose of a systematic presentation of the results, a tabular overview of filed criminal complaints for the criminal offense of association for the purpose of committing criminal offenses under Article 346 of the Criminal Code is presented below, as well as other criminal offenses encompassed by such complaints, together with the structure of perpetrators [28, pp. 1–5].

The analysis of the presented data indicates several significant trends. First, it is observed that a relatively small number of criminal complaints (10) encompasses a significantly larger number of criminal offenses (141+) and perpetrators (144), which indicates the existence of complex criminal structures in which association serves only as an initial legal framework for broader criminal activity. This disproportion clearly confirms the existence of

Table No. 1

Year	Number of Criminal Complaints (Art. 346 CC)	Number of Criminal Offenses	Total Perpetrators_	Police Officers	Citizens	Customs Officers	Structure of Other Criminal Offenses
2017.	2	21+	88	31	43	14	Arts. 367., 368., 359. CC
2019.	2	13	12	2	9		Arts. 359., 366., 355. и 246. CC
2020.	1	28	9	3	6		Arts. 246., 359., 348., 355. and 356. CC
2022.	5	79	35	11	24		Arts. 114., 246., 245., 359., 366., 348., 278. CC and Arts. 98. LCPD
Total	10	141+	144	47	82	14	

organized criminal networks in which corruption performs a systemic function.

The structure of perpetrators shows a significant participation of police officers (47 individuals), which confirms the presence of so-called "insider" corruption. At the same time, the presence of citizens and customs officers indicates inter-institutional connectivity and the existence of horizontal corrupt networks, particularly in high-risk areas such as border crossings and the control of goods flows.

From a chronological perspective, the year 2017 is characterized by a large number of perpetrators and the dominance of corruption-related criminal offenses, primarily the giving and receiving of bribes. The significant participation of police and customs officers indicates the existence of organized corruption networks, which already at this stage points to elements of transnational organized crime.

In 2019, a qualitative transformation occurs, whereby the structure of criminal offenses becomes more complex and includes trading in influence and document forgery. A particularly significant case involved police officers who, through abuse of official powers, enabled the issuance of false biometric documents to individuals from criminal milieus. This form of conduct represents a direct link between institutional mechanisms and criminal structures, thereby significantly increasing the threat to the legal order.

During 2020, further escalation is observed, reflected in the emergence of criminal offenses related to drug trafficking, illicit arms trafficking, and document forgery. The involvement of members of other structures is particularly significant, indicating the expansion of corrupt networks and the formation of complex criminal systems that extend beyond a single institution.

The highest degree of complexity is observed in 2022, when the largest number of criminal offenses is recorded, including the most serious forms of crime, such as aggravated murder, money laundering, and abuse of confidential data. This period is also characterized by increased participation of police officers in organized criminal groups, clearly indicating the development and deepening of "insider" corruption as a key mechanism for the protection of criminal structures.

These trends are further confirmed by concrete cases from practice. In a case related to a high-level organized criminal group, a pronounced degree of institutional infiltration is observed, whereby police officers in key positions were involved in abuse of office, disclosure of classified information, and provision of logistical support. Particularly significant is the misuse of official resources, which enables criminal actors to create the appearance of institutional legitimacy, representing one of the most dangerous forms of corruption.

In another example, which has a distinctly transnational character, a criminal group operated across multiple continents, with the involvement of members of the security system in collecting and transmitting confidential information. In this way, the avoidance of criminal prosecution and the uninterrupted functioning of criminal activities were enabled, including the transportation of narcotics and financial assets. The use of encrypted communication channels indicates a high level of technological sophistication, but also highlights the limitations of traditional control mechanisms.

A synthetic analysis of the tabular data and the presented examples leads to the conclusion that police corruption has a multi-layered character and manifests itself through various forms, ranging from classical corruption offenses to direct participation in organized criminal groups. The common function of all these forms lies in enabling, facilitating, and protecting organized crime, which makes corruption its constitutive element.

Accordingly, the key significance of this analysis lies in the fact that it unequivocally confirms that the fight against organized crime cannot be successfully conducted without the simultaneous suppression of corruption within institutions. The effectiveness of repressive mechanisms directly depends on the level of institutional integrity, indicating that preventive mechanisms, internal control, and international cooperation must be positioned as central elements of a modern strategy for combating organized crime.

CONCLUSION

Starting from a comprehensive theoretical, normative, and empirical analysis, it can be reliably concluded that corruption of police officers represents one of the key structural and functional factors that enable not only the emergence, but also the continuous functioning and adaptation of organized crime. In contemporary conditions, this phenomenon goes beyond the framework of individual deviant behavior and assumes the character of a systemic mechanism that establishes and maintains a connection between criminal structures and the institutional apparatus of the state, thereby directly endangering the fundamental values of the legal order, primarily the rule of law, legal certainty, and institutional integrity.

Empirical findings, particularly those derived from the practice of the Internal Control Sector, clearly indicate the existence of both continuity and evolution of corrupt patterns. A transition is observed from traditional, individual forms of corruption to complex, organized, and network-based forms, within which police officers in certain cases no longer act merely as passive actors, but as active participants, and even key agents in the functioning of organized criminal groups. Of particular importance in this context is the so-called "insider" corruption, which enables the abuse of official position through access to confidential information, influence over the course of investigations, manipulation of evidence, and obstruction of criminal prosecution, thereby significantly increasing the operational efficiency, but also the resilience of criminal structures to the actions of law enforcement authorities.

The analysis indicates that corruption within police structures encompasses a significantly broader spectrum of conduct than merely obtaining unlawful material gain. It includes the abuse of powers, resources, institutional position, and information for the purpose of protecting or advancing criminal activities, including those with a transnational element. In this sense, corruption appears as a key catalyst that enables organized crime to overcome institutional barriers, evade criminal liability, and achieve significant economic and social power.

Although it can be noted that the normative framework of the Republic of Serbia largely follows relevant international standards in the field of combating corruption and organized crime, the key issue remains its consistent and effective implementation. Deficiencies in implementation, institutional weaknesses, as well as certain organizational and functional challenges within the security system, represent significant obstacles to achieving the full effect of the existing legal mechanisms.

Accordingly, it can be concluded that effective counteraction to organized crime requires an integrated, multidisciplinary approach that combines repressive and preventive mechanisms, along with strengthening institutional capacities and system resilience. Particular importance lies in the development and improvement of preventive instruments, such as integrity tests, asset control systems, and internal control mechanisms, which contribute to the early detection and suppression of corrupt practices.

At the same time, strengthening international cooperation represents an indispensable segment of the contemporary strategy for combating organized crime, bearing in mind its distinctly transnational character. The exchange of information, joint investigations, and the harmonization of legal standards constitute key elements in building an effective response to this phenomenon.

Following the above, it is concluded that the essential challenge in the forthcoming period will not be further improvement of the normative framework, but rather the development of strong institutional integrity and a culture of accountability within the security system. Only the consistent application of the law, with clearly defined mechanisms of control and sanctioning, can lead to a substantial reduction of corruption and thereby weaken one of the most important pillars of organized crime.

Ultimately, the fight against corruption within police structures is not merely a matter of internal control, but a prerequisite for the effective protection of the legal order, public security, and public trust in state institutions.

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КОРУПЦИЈА ПОЛИЦИЈСКИХ СЛУЖБЕНИКА КАО ФАКТОР ОГРАНИЗОВАНОГ КРИМИНАЛА

Резиме: *Корупција међу полицијским службеницима представља један од најзначајнијих фактора који омогућава развој, функционисање и дугорочно одржавање организованог криминала. У савременим условима она не представља искључиво појединачно девијантно понашање, већ добија обележја системске појаве која делује као функционални механизам повезивања криминалних структура са институцијама државе. Предмет овог рада је анализа функционалне улоге корупције унутар полицијских структура у контексту организованог криминала, са циљем да се укаже на начине на које корумпирани полицијски службеници доприносе формирању, заштити и стабилизацији организованих криминалних група. Рад се заснива на теоријској, нормативној, институционалној епиријској анализи, при чему се посебна пажња посвећује кривичноправном оквиру инкриминације коруптивних кривичних дела, као и институционалним механизмима контроле рада полиције. У том контексту разматрају се превентивне мере, као што су унутрашња контрола, јачање интегритета и етичких стандарда, али и репресивне мере које обухватају кривичне истраге, процесуирање и санкционисање корумпираних службеника. Закључује се да је ефикасно сузбијање организованог криминала немогуће без системске и доследне борбе против корупције у полицији.*

Кључне речи: *корупција, полицијски службеници, организовани криминал, превентивне мере, репресивне мере, институционални интегритет*

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ANALYSIS AND DEVELOPMENT OF PUBLIC POLICIES IN MONTENEGRO IN THE FIELD OF ARTIFICIAL INTELLIGENCE

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Abstract: *The research presented in this paper focuses on public policy on artificial intelligence in Montenegro. Particular emphasis is placed on the formulation of these policies and their analysis from the perspective of compliance with the requirements necessary to ensure the preconditions for the development and application of artificial intelligence in Montenegro. The research aims to analyze public policies on artificial intelligence in Montenegro and assess whether they meet development requirements. The content analysis method of available documents was applied in the study, primarily its qualitative content analysis technique, focusing on the development of public policies in the field of artificial intelligence, the analysis of legal regulations and scientific literature in this area, with an emphasis on practical applications. The results of the research indicate a high degree of alignment between Montenegro's public policies and the needs of artificial intelligence development, while also identifying areas that require further improvement, such as the development of the legal framework.*

Keywords: *Artificial Intelligence, Montenegro, public policy, public policy formulation, analysis of public policies, application of artificial intelligence*

1. INTRODUCTION

The Government of Montenegro, in cooperation with the United Nations Development Programme (UNDP) in Montenegro and the Central Digital Office, is implementing a significant set of activities aimed at increasing the use of artificial intelligence (AI) and achieving positive effects of its application across all segments of society. The activities carried out by the Government of Montenegro in this field demonstrate its readiness to establish the preconditions necessary for the efficient application of artificial intelligence in all areas of society.

Montenegro has considerable potential for the use of artificial intelligence to improve all segments of society, strengthen the economy, and achieve sustainable development goals defined by national policies and plans. The use of artificial intelligence enables a more efficient realization of the national development vision, with particular emphasis on its potential in critical sectors such as education, poverty reduction, economic development, and the improvement of the healthcare system.

With the aim of enhancing the use of artificial intelligence, the Government of Montenegro, in cooperation with various partners, places emphasis on the formulation of public policies designed to ensure the fulfillment of preconditions necessary for the efficient and lawful use of these technologies. Public policies in the field of artificial intelligence development in Montenegro are still in the early stages of development. One of the factors significantly slowing down the creation of public policies in Montenegro is the lack of legal regulation on artificial intelligence, primarily due to the fact that the European Union has not yet adopted the legislation on which such regulation should be based.

The research covers the most significant elements related to the formulation and analysis of public policies in the field of artificial intelligence in Montenegro. The subject of the research conducted in this paper is public policy in Montenegro in the field of artificial intelligence. The aim of the research is to analyze public policies in Montenegro in the field of artificial intelligence and to highlight their key contents and significance for the further development of all segments of society.

2. ARTIFICIAL INTELLIGENCE

Artificial intelligence is a field of computer science that studies the development of intelligent computer systems capable of identifying input elements, analyzing them, and responding accordingly [1, p. 179]. It is based on principles characteristic of human intelligence and elements such as thinking, the application of logic, reasoning, understanding complex phenomena, and autonomous decision-making. If a given computer system possesses basic skills characteristic of humans - such as the ability to learn, draw conclusions, understand language, improve itself through learning from experience, or solve problems of varying levels of complexity - it can be considered as a artificial intelligence system [2, p. 24].

Russell and Norvig define artificial intelligence as “the field of computer science that studies the automation of intelligent behaviors” [3, p. 14]. Artificial intelligence is the capability of computer systems to correctly perform tasks that were previously carried out exclusively by humans, such as accurately interpreting data collected from external sources, learning from such data, and using the acquired knowledge, through flexible adaptation, to achieve assigned goals and tasks [4, p. 40].

Artificial intelligence is a transformative technology with the potential to bring about significant changes across all segments of modern society. This technology has the capacity to analyze large volumes of data, identify trends and patterns, generate predictions, and support decision-making. Artificial intelligence enables substantial improvements in the efficiency, effectiveness, and quality of numerous processes and activities, which is why it represents one of the key elements underpinning the contemporary society development [5, p. 1].

3. STATE OF THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN MONTENEGRO

The application of artificial intelligence in Montenegro is in an early stage of development, characterized by high dynamism and frequent changes. The current level of artificial intelligence development in Montenegro is marked by the gradual implementation of AI-based solutions across various segments of society. Despite the fact that artificial intelligence is still not widely used and is not applied in a systematic manner, a large number of initiatives are being carried out with the aim of its integration, primarily in the fields of public administration, finance, tourism, and telecommunications. An increasing number of institutions, companies, and individuals in Montenegro clearly recognize the potential of artificial intelligence, particularly in areas related to improving efficiency, process optimization, and enhancing the quality of services.

3.1. Analysis of the Potential for the Application of Artificial Intelligence in Montenegro

Montenegro has developed a digital environment that provides significant potential for the application of artificial intelligence. Approximately 80% of households in

Montenegro are connected to the internet, while the percentage of mobile phone users in the population is at a similar level, amounting to 79.8% [6, p. 12]. Urban areas of Montenegro are well covered by fourth-generation mobile networks, with the gradual introduction of 5G infrastructure, which will significantly enhance the possibilities for more efficient use of digital technologies and artificial intelligence. One of Montenegro's advantages is its well-developed legislative framework, based primarily on the Law on Personal Data Protection [7]. This legislative framework ensures effective protection of privacy and data security, without which the efficient and safe use of artificial intelligence would not be possible.

Public policies and legislative regulations provide a solid foundation for the development of artificial intelligence applications in Montenegro. Despite certain shortcomings, public policies related to artificial intelligence offer comprehensive frameworks for its efficient implementation and the achievement of the greatest possible positive effects. The importance of public policies primarily stems from the growing impact of artificial intelligence on all segments of society in Montenegro, its widespread application, and the numerous risks and challenges associated with its use.

3.2. Challenges in the Application of Artificial Intelligence in Montenegro

When analyzing and formulating public policies in the field of artificial intelligence in Montenegro, it is essential to take into account numerous challenges associated with the use of these technologies. These challenges are multidimensional and can significantly affect the future of artificial intelligence application; therefore, it is necessary for public policies to define mechanisms for their mitigation and effective resolution. The most significant challenges in the application of artificial intelligence in Montenegro include [6, p. 10]:

lack of knowledge and skills required for the effective application of artificial intelligence,

- inadequate level of infrastructure development,
- legislative limitations, and
- resistance to the adoption of artificial intelligence.

The lack of human resources possessing the knowledge and skills necessary for the application of artificial intelligence can significantly slow down its use and the implementation of public policies in this field [8, p. 1642]. Montenegro faces a shortage of professionals with technical expertise in areas such as artificial intelligence, information and communication technologies, and cybersecurity. This shortage is a significant constraint to the development and application of AI-based tools, which is why public policies and strategic plans must include elements related to formal education in artificial intelligence, as well as professional training for employees and individuals in the labor market to perform these jobs.

An insufficient level of infrastructure development is one of the factors that represents a limitation to the application of artificial intelligence in many countries. In numerous scientific studies, inadequate infrastructure is identified as one of the most significant obstacles to the development of artificial intelligence and the achievement of its maximum positive effects [9, p. 96]. In Montenegro, it is necessary to modernize the existing information and communication infrastructure in order to adapt it to new requirements which artificial intelligence brings. Public policies must also include activities aimed at improving infrastructure, without which efficient implementation of artificial intelligence cannot be ensured.

Despite significant progress in this area, the legislative framework governing the application of artificial intelligence in Montenegro remains insufficiently developed. Artificial intelligence is a rapidly evolving field, which makes it difficult for national legislation to adapt effectively to ongoing changes [10, p. 2]. Legislation and related regulations in Montenegro do not evolve quickly enough, resulting in insufficient alignment with the changes brought about by AI-based technologies. Public policies in Montenegro increasingly take artificial intelligence into account; however, they need to be further adapted to ensure a more efficient and timely response to changes resulting from the development of artificial intelligence and digitalization.

The application of artificial intelligence is also associated with significant resistance, stemming from the influence of a numerous factors. Resistance is one of the key factors that can significantly hinder or even completely prevent the adoption of artificial intelligence across all segments of society [11, p. 16]. Among the main factors contributing to resistance in Montenegro are traditional ways of thinking and low levels of awareness regarding the benefits of artificial intelligence use [6, p. 10]. Resistance is largely the result of insufficient familiarity with artificial intelligence and the spread of misinformation in the public sphere. Public policies in Montenegro should place greater emphasis on educating citizens about the advantages of artificial intelligence in order to reduce resistance, which currently has a significant negative impact on its adoption.

4. ARTIFICIAL INTELLIGENCE LEGISLATIVE IN MONTENEGRO

The legal framework governing the use of artificial intelligence based technologies in Montenegro is in the early stages of development. One of the main shortcomings is the absence of laws and national strategies that directly regulate technologies based on artificial intelligence and their practical application [12, p. 3]. At the current stage of development, the use of artificial intelligence based technologies is regulated through general principles contained in various existing laws. These laws and accompanying documents are applied in different ways, depending on the context in which artificial intelligence is used.

A number of factors contribute to the absence of laws and strategies related to the application of artificial intelligence in Montenegro. In addition to the extremely rapid development of artificial intelligence, which requires continuous amendments to laws, strategies, and public policies, a significant factor is also the high dependence on the legal framework of the European Union in this field. As a country in the accession process to the European Union, Montenegro is obliged to fully harmonize its national legislation with EU law. This obligation significantly limits Montenegro's ability to adopt laws related to artificial intelligence, given that the European Union has not yet fully defined its legal framework, which serves as the basis for national legislation in member states and candidate countries. Adopting legal regulations prior to their adoption at the EU level would represent an unnecessary effort for Montenegro, as such documents would need to be subsequently aligned with EU legislation once it is enacted.

The development of legal regulation and public policies in the field of artificial intelligence has also been negatively affected by political instability [*Ibidem*]. Frequent changes of government in Montenegro since 2020 have resulted in a lack of sustained focus on artificial intelligence. The adoption of legislation in this field is often considered less important compared to reforms in key areas of state functioning, such as law, the economy, and security. The absence of a legal framework significantly complicates all aspects of the application of artificial intelligence in Montenegro, including those related to public policies in this field.

The lack of legal regulation and cases from practice has also resulted in the absence of clear guidelines for the application of artificial intelligence. In Montenegro, general legal principles are most commonly applied to artificial intelligence, which are often inadequate and insufficiently defined. This lack of regulation negatively affects both the formulation and analysis of public policies in the field of artificial intelligence [*Ibidem*]. These effects are primarily due to the absence of a legal framework and guidelines governing the use of artificial intelligence, which serve as the basis for defining and implementing public policies in this area. In many cases, the absence of legal regulation necessitates consultation with experts in order to avoid potential issues in the formulation and implementation of AI-related public policies in Montenegro.

The successful implementation of artificial intelligence and projects based on its use is not possible without a legal framework that defines its application. The importance of legal regulation is further emphasized by the fact that the use of artificial intelligence is associated with issues related to privacy protection, potential data security risks, and numerous ethical concerns [13, p. 6]. The absence of clearly defined legal regulations and guidelines can significantly reduce readiness for the adoption of artificial intelligence in Montenegro. This reduction in readiness is primarily a consequence of uncertainty arising from the lack of clear rules governing the use of artificial intelligence, as well as the rights and obligations associated with it.

Legal regulatiive related to fields such as cybersecurity and telecommunications also have a significant impact on public policies in Montenegro concerning artificial intelligence. Laws and by-laws in these areas, due to their relevance for the application of artificial intelligence, must also be taken into account when formulating public policies. Montenegro needs to develop explicit and comprehensive legal regulation that, in addition to technical aspects of artificial intelligence use, also covers its practical application and the potential legal consequences that may arise [12, p. 4]

5. ARTIFICIAL INTELLIGENCE LANDSCAPE ASSESSMENT - MONTENEGRO

The Artificial Intelligence Landscape Assessment - Montenegro is one of the most significant documents addressing public policies in the field of artificial intelligence in Montenegro. This report, published in 2024, was developed by the United Nations Development Programme, the Government of Montenegro, and the European Union. Its importance lies in the highly detailed and objectively conducted analysis of Montenegro's readiness for the introduction and development of artificial intelligence in the public sector. Despite being primarily focused on the public sector, the report also includes a wide range of information relevant to the application of artificial intelligence in other areas and related public policies. The Artificial Intelligence Landscape Assessment serves as a foundation for the development of future public policies in the field of artificial intelligence in Montenegro.

The significance of the Artificial Intelligence Landscape Assessment for Montenegro is multifaceted. This report provides a comprehensive analysis of the country's readiness to adopt artificial intelligence technologies and apply them across different segments of society. As such, it is expected to have a strong influence on both the analysis of existing and the formulation of new public policies in this field. Unlike other strategic documents in this area, the report places emphasis on the concrete capacities available to the state. It also identifies existing shortcomings and provides recommendations for their improvement in order to ensure the effective implementation of artificial intelligence.

The Artificial Intelligence Landscape Assessment - **Montenegro** is a document used for country-level evaluation. The methodology of the report is based on three core pillars that determine the state of artificial intelligence: the government as a user of artificial intelligence, the role of the government as a driver of the artificial intelligence ecosystem, and the promotion of ethical use of artificial intelligence at the national level [6, p. 3]. The assessment is based on both quantitative and qualitative data, which significantly enhances its quality and relevance as a tool for the development and analysis of public policies in the field of artificial intelligence. The main objective of the report is to enable an objective assessment of Montenegro's readiness for the adoption, ethical development, and responsible use of artificial intelligence. The report also includes recommendations on how best to implement artificial intelligence and design public policies in this area.

The main advantages of the Artificial Intelligence Landscape Assessment in Montenegro, from the perspective of public policy, include:

- the use of a systemic approach to analyzing all key elements of artificial intelligence in Montenegro,
- the identification of institutional, technological, and educational gaps and constraints,
- the creation of a foundation for developing a national strategy for the development and application of artificial intelligence in Montenegro, and
- the provision of recommendations for the development of public policies in the field of artificial intelligence.

The methodology used in the Artificial Intelligence Landscape Assessment - **Montenegro** is based on a multidimensional approach covering various aspects that influence Montenegro's level of readiness for artificial intelligence implementation. The report includes elements such as the institutional framework, human resources, infrastructure, regulatory environment, and the level of artificial intelligence application in the public sector [6, p. 3]. This methodology enabled an objective assessment of strengths and weaknesses, as well as the formulation of concrete recommendations for improving public policies in the field of artificial intelligence.

6. DIGITAL TRANSFORMATION STRATEGY OF MONTENEGRO 2022-2026

The Digital Transformation Strategy of Montenegro for the period 2022-2026 is the most important document defining the directions of digital society development, public administration improvement, and strengthening the competitiveness of the economy through the use of modern technologies. This document represents one of the key elements of public policies in the field of artificial intelligence in Montenegro. Special attention in the Strategy is devoted to the development and application of artificial intelligence, which is defined as one of the most important drivers of growth and development across all segments of society.

Within the Strategy, four basic elements on which the digital transformation of Montenegro is based are defined [14]:

- development of digital infrastructure,
- digitalization of public services,
- support for innovation in the private sector, and
- improvement of citizens' digital skills.

Artificial intelligence plays a numerous roles in each of these elements and is viewed as one of the key drivers of Montenegro's digital transformation. One of the main objectives of the Digital Transformation Strategy of Montenegro for the period 2022-2026 is the use of artificial intelligence for the modernization and improvement of public administration. The application of artificial intelligence is particularly emphasized in the processes of digitalization in healthcare, tax administration, and education. The most significant positive effects of artificial intelligence in these areas include increased transparency, greater efficiency, and lower costs [15, p. 9].

The Digital Transformation Strategy of Montenegro for the period 2022-2026 is also one of the public policy documents in Montenegro that emphasizes the importance of artificial intelligence in the education sector and recognizes the need to develop competencies in this field. It highlights the need to introduce artificial intelligence training in both formal and non-formal education systems in order to ensure sufficient human resources for its development and use. This segment of the Strategy is fully aligned with global trends and the fact that the use of artificial intelligence is becoming one of the most important skills for employees.

Within the Digital Transformation Strategy of Montenegro for the period 2022-2026, significant emphasis is also placed on the application of artificial intelligence in the economic activities. By supporting the development of startups working in artificial intelligence and innovation in this field, Montenegro seeks to improve its economy and all segments of society. Special focus is also placed on the application of artificial intelligence in tourism, as one of the most important economic sectors. The Strategy also includes elements related to more efficient resource management.

The Digital Transformation Strategy of Montenegro for the period 2022-2026 highlights all major challenges associated with the effective implementation of artificial intelligence in Montenegro. The importance of this document is reflected in the emphasis on the need for alignment with European Union regulations, with particular focus on privacy protection and responsible use of artificial intelligence. The Strategy also covers regional and international cooperation, which is an important element of public policies in the field of artificial intelligence. Public policies in Montenegro are increasingly oriented toward alignment with the digital agendas of the European Union and participation in major international organizations and research projects. The Digital Transformation Strategy of Montenegro for the period 2022-2026 encompasses all key elements of the framework for the development of a digital society, which is based on the use of artificial intelligence as its central component.

7. PRIORITIES OF PUBLIC POLICIES IN THE FIELD OF ARTIFICIAL INTELLIGENCE IN MONTENEGRO

The activities undertaken with the aim of developing public policies for the application of artificial intelligence in Montenegro are directed toward several different paths. The priorities defined in the development of public policies include economic objectives to be achieved at the national level, the needs of the state and local communities, as well as the obligations Montenegro has assumed in the process of European Union accession. These priorities cannot be viewed as isolated components, they are interrelated and form the basis for the creation of systemic approaches in the field of artificial intelligence.

One of the fundamental priorities underlying public policies for the development of artificial intelligence is its implementation in public administration, which would significantly improve the quality and efficiency of the services it provides. The process of digitalization of public administration in Montenegro began in 2011 with the development of e-government and can be significantly enhanced through the application of various artificial intelligence-based tools [14, p. 34]. The use of artificial intelligence, such as the automation of citizen request processing, can substantially improve numerous segments of public administration work. In addition to increasing efficiency, significant positive effects of artificial intelligence in public administration include cost reduction and increased transparency, which also positively influence citizens' trust.

Public policies in Montenegro place considerable emphasis on the use of artificial intelligence to develop a national economy based on innovation. The application of artificial intelligence can bring significant changes and improvements in the most important sectors of the national economy of Montenegro. Public policies focus on providing support to startups and implementing various types of technological innovation. The role of the state is to create different types of incentives for companies engaged in the development of artificial intelligence. Public policies are also aligned with recommendations issued by international organizations, which emphasize the importance of innovation in ensuring economic growth [16].

Significant attention in Montenegrin public policies is also devoted to the creation of a legal and ethical framework related to the application of artificial intelligence. This segment of public policies is essential for ensuring citizens' trust in artificial intelligence. The level of trust is largely influenced by perceptions of the safety and fairness of artificial intelligence use. Future public policies must include regulatory elements related to the protection of human rights, the transparency of algorithms used in artificial intelligence systems, and accountability for decisions made by such systems. In this area, Montenegro applies the standards of trustworthy artificial intelligence defined by the European Union [17].

The insufficient number of individuals with expertise in artificial intelligence is one of the key challenges which Montenegro is currently facing in the development and application of these technologies. Issues related to available human resources represent a significant barrier to the implementation of public policies in the field of artificial intelligence. Public policies must increasingly address the adaptation of the formal education system at all levels in order to align it with the new requirements imposed by artificial intelligence. In addition to formal education in artificial intelligence, public policies also include training programs for civil servants and employees in companies to ensure adequate skills for the use of AI-based tools. Results of numerous studies indicate that human resource development is a fundamental prerequisite for ensuring the long-term sustainable development of artificial intelligence [18, p. 2].

Public policies in the field of artificial intelligence in Montenegro also include elements related to the development of information and communication infrastructure and data availability. The efficiency of artificial intelligence systems directly depends on the quantity and quality of data available to them [19, p. 429]. Within public policies, mechanisms for improving data collection, processing, and exchange systems are also included, in order to provide a solid foundation for artificial intelligence operations. Effective data management mechanisms can also significantly facilitate the work of private sector companies engaged in the development of artificial intelligence tools.

International cooperation in the field of artificial intelligence is another important aspect of Montenegrin public policies in this area. The importance of international cooperation is largely a consequence of Montenegro's size, as it is too small and economically insufficiently strong to independently develop all components of the artificial intelligence ecosystem. Establishing effective international cooperation in the development and application of artificial intelligence is of key importance for Montenegro. As a candidate country, Montenegro has access to European Union programs that, through financial support and expert assistance, can significantly enhance national capacities in the field of artificial intelligence.

Increasing the availability of digital technologies and related services is one of the core elements of public policies in the field of artificial intelligence in Montenegro. The availability of digital technologies implies that they are accessible to all citizens, regardless of their education, place of residence, economic situation, or social status [20, p. 2]. If not adequately addressed through public policies, the digital divide may represent a significant obstacle to the development and application of artificial intelligence in Montenegro. In this segment of public policies, emphasis must be placed on education and the availability of digital technologies, which, despite their high level of penetration in Montenegro, are still not accessible to a significant portion of the population.

8. CONCLUSION

Public policies in the field of artificial intelligence in Montenegro also face a large number of different challenges that may significantly jeopardize progress in this area. The most important constraints identified in public policy documents include the lack of financial resources, an insufficient number of experts in the field of artificial intelligence, and underdeveloped legal regulation in this area. In order to ensure the effective implementation of public policies in the field of artificial intelligence, it is also necessary to establish better cooperation between different state authorities, between different levels of government, as well as cooperation between the public sector, the private sector, and citizens.

The state plays a key and most significant role in the formulation of public policies in the field of artificial intelligence in Montenegro. This role is threefold: the state must assume responsibility for strategic planning of the development and implementation of artificial intelligence, defining the legal framework for its use, and ensuring the preconditions necessary for the implementation of innovation. The fulfillment of the state's role and the development of artificial intelligence can only be ensured through the creation and implementation of precisely defined and high-quality public policies, investment in necessary infrastructure, education, and strengthening cooperation between the public and private sectors.

The priorities of public policies in the field of artificial intelligence in Montenegro are currently focused on the modernization of public administration, ensuring the necessary infrastructure, developing an economic system that encourages and facilitates innovation, strengthening human resources, and protecting citizens and the economy from various forms of potential misuse. The effects achieved by current and future public policies in the field of artificial intelligence in Montenegro will largely depend on the state's ability to provide the necessary resources and to efficiently coordinate the activities carried out by different stakeholders involved in the process of introducing artificial intelligence.

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АНАЛИЗА И РАЗВОЈ ЈАВНИХ ПОЛИТИКА У ЦРНОЈ ГОРИ У ОБЛАСТИ ВЈЕШТАЧКЕ ИНТЕЛИГЕНЦИЈЕ

Резиме: *Предмет истраживања које је обављено у раду су јавне политике у области вјештачке интелигенције у Црној Гори. Посебан акценат је стављен на креирање ових политика и њихову анализу из перспективе усклађености са захтјевима који морају бити испуњени како би се обезбиједили предуслови, који су неопходни за развој примјене вјештачке интелигенције у Црној Гори. Циљ истраживања је анализа јавних политика у области вјештачке интелигенције у Црној Гори и провјера њихове усклађености са захтјевима њеног развоја. У раду је примијењена метода анализе садржаја доступних докумената, прије свега њена техника квалитативне анализе садржаја са фокусом на креирању јавних политика у области вјештачке интелигенције, анализи законске регулативе и научне грађе у овој области, с тежином на практичној примјени. Резултати истраживања указују на висок степен усклађености јавних политика Црне Горе са потребама развоја вјештачке интелигенције, при чему постоје и области у којима оне додатно морају бити унапријеђене, попут развоја правне регулативе.*

Кључне речи: *Вјештачка интелигенција, Црна Гора, јавне политике, креирање јавних политика, анализа јавних политика,примјена вјештачке интелигенције*

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AI-BASED DECISION SUPPORT MODELING IN DIGITAL MARKETING USING SEM

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Abstract: *Contemporary digital marketing is increasingly shaped by the application of AI-based systems and intelligent chatbot solutions, which generate extensive data on user interactions and behavioral patterns. Although the existing literature thoroughly examines the relationships between these technologies, user engagement, and behavioral outcomes, limited attention has been given to the development of formalized models that integrate these relationships into managerial decision-making support. This paper proposes an analytical framework based on Structural Equation Modeling (SEM), in which user engagement and behavioral outcomes are analyzed through a formal structural model, while AI-based systems and chatbot systems are considered at a conceptual level as potential influencing factors. The objective of the study is to demonstrate how the identified structural relationships can serve as a quantitative foundation for analyzing relationships in digital marketing. The results indicate that user engagement plays a key role as a mediating mechanism between digital interactions and behavioral outcomes. The proposed framework provides a foundation for further empirical research and the extension of the model in real business environments.*

Keywords: *artificial intelligence, decision support systems, digital marketing, user engagement, Structural Equation Modeling (SEM)*

1. INTRODUCTION

Contemporary digital marketing is characterized by the intensive development of technologies that enable continuous, personalized, and scalable interaction between organizations and users [1, 2]. In this context, AI-based systems, including intelligent chatbot solutions, increasingly act as intermediaries in digital communication channels, shaping the way users interact with content and brands.

In digital marketing research, user engagement occupies a central role and is most commonly conceptualized as a multidimensional latent construct encompassing cognitive, emotional, and behavioral components [3, 4]. Rather than being treated as a direct outcome of marketing activities, engagement is often modeled as a mediating mechanism through which digital marketing activities influence user behavior, interaction intensity, and communication reach [3, 4, 5].

From a methodological perspective, Structural Equation Modeling (SEM) represents a dominant analytical framework for examining such relationships [6, 7, 8, 9]. SEM enables the simultaneous analysis of latent and manifest variables, as well as the estimation of direct and indirect effects between constructs, making it particularly suitable for modeling complex relationships in digital marketing research.

In existing studies, AI-based systems and chatbot systems are most often modeled as exogenous latent constructs, with emphasis placed on user perception rather than technical implementation [1, 2]. Characteristics such as response speed, level of personalization, communication consistency, and clarity of interaction are treated as latent variables influencing perceived interaction quality and user engagement. Accordingly, AI systems are primarily considered indirect drivers of user behavior through their impact on engagement [1, 2].

A consistent structural pattern identified in prior research suggests that AI-driven digital marketing activities do not directly influence user behavior, but rather indirectly, through user engagement as a central mediating construct [3, 4, 5]. Although this relationship has been empirically validated across different digital and market contexts, the existing literature largely focuses on explaining user behavior, while less attention has been given to transforming these relationships into formalized managerial decision-support frameworks. This limitation creates a gap between analytical capabilities and their practical application in managerial decision-making.

This gap is particularly significant in digital marketing practice, where managers make strategic decisions regarding platform selection, channel allocation, timing, and audience engagement intensity, often relying on experience or intuitive judgment [6, 7]. Despite the availability of advanced analytical methods, quantitative decision-support frameworks are still insufficiently integrated into managerial processes.

Starting from this problem, the objective of this study is the integration of predictive models based on artificial intelligence, intelligent chatbot systems, and Structural Equation Modeling into a unified decision-support framework for digital marketing management. Understanding the structural relationships between these constructs provides the basis for developing an analytical model that enables systematic analysis of relationships among key constructs in digital marketing. The scientific contribution of this paper lies in the separation of conceptual and empirical levels of modeling, where the Structural Equation Model is used as a formal framework for the quantitative evaluation of relationships between user engagement and behavioral outcomes, while AI-based systems and chatbot systems are introduced as conceptual factors that enable the interpretation of the model in a decision-support context.

In this way, the paper moves beyond purely descriptive analysis of user behavior and introduces a structured approach to the application of SEM in analyzing relationships between user engagement and behavioral outcomes in digital marketing.

2. STRUCTURAL EQUATION MODELING (SEM) FRAMEWORK

In this study, Structural Equation Modeling (SEM) is used as the central analytical framework for examining the relationship between user engagement and behavioral outcomes in digital marketing, while AI-based systems and chatbot systems are considered at the conceptual level of the model [6, 7]. SEM is particularly suitable for this research because it enables the simultaneous estimation of measurement models of latent constructs and structural relationships between those constructs within a unified mathematical system. Formally, the SEM model can be represented through two main components: the measurement model and the structural model.

The conceptual structure of the proposed model is illustrated in Figure 1, providing a clear overview of the key relationships analyzed in this study.

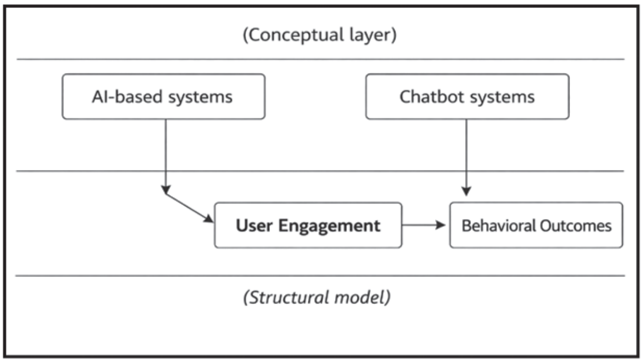

Figure 1. Conceptual framework of the proposed SEM model

The figure presents the conceptual structure of the proposed model. AI-based systems and chatbot systems are considered as conceptual influencing factors, while user engagement is modeled as a central mediating construct linking digital interactions to behavioral outcomes within the SEM framework.

The measurement model defines the relationship between latent and observed variables:

(1) $x = \Lambda x\ \xi + \delta$

(2) $y = \Lambda y\ \eta + \varepsilon$

where x and y are vectors of observed variables, ξ and η are latent variables, Λx and Λy are loading matrices, while δ and ε represent measurement errors.

The structural model describes the relationships between latent variables:

(3) $\eta = B\eta + \Gamma\xi + \zeta$

where matrix B represents relationships among endogenous latent variables, Γ represents relationships between exogenous and endogenous constructs, while ζ denotes the structural error of the model.

In the context of this study, the focus of the empirical analysis is directed toward the relationship between user engagement and behavioral outcomes, while AI-based systems and chatbot systems are considered at the conceptual level of the model.

The proposed SEM framework follows a two-step analytical procedure, in accordance with standard SEM methodology [6, 7]:

(Step 1) Specification and validation of the measurement model

(Step 2) Estimation and evaluation of the structural model

This two-step approach ensures that latent constructs are reliably and validly measured prior to the analysis of relationships between them.

The figure illustrates the two-step analytical procedure applied in this study within the Structural Equation Modeling (SEM) framework. In the first step, the measurement model is evaluated to ensure the reliability and validity of the latent construct of user engagement and its observed indicators [6, 7].

In the second step, the structural model is estimated in order to determine the direct relationships between user engagement and behavioral outcomes represented through an observed variable. The resulting path coefficients provide the basis for the quantitative assessment of the relationship between user engagement and behavioral outcomes in digital marketing.

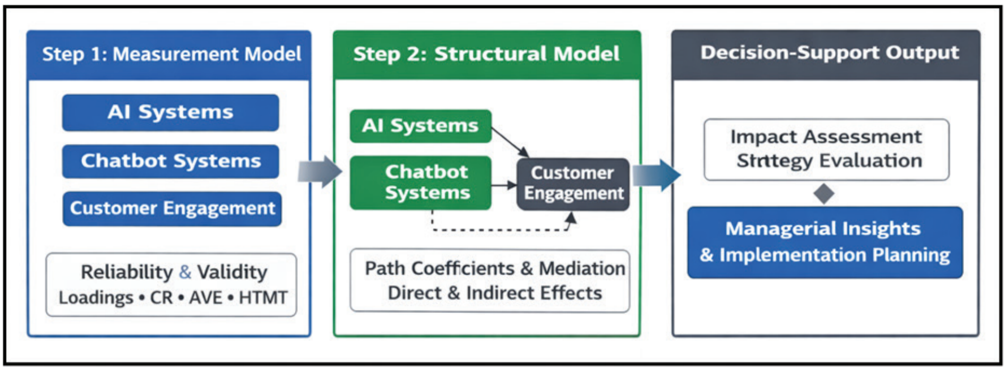

Figure 2. Two-step SEM analytical procedure for decision support in digital marketing

2.1 Step 1 – Measurement Model Specification

The measurement model defines the relationships between latent constructs and their observed indicators.

In this study, user engagement is modeled as a latent variable that cannot be directly observed, but is instead estimated based on multiple manifest indicators operationalized through available metrics in the dataset.

AI-based systems and chatbot systems are considered at the conceptual level and are not part of the empirically estimated measurement model.

User engagement is conceptualized as a multidimensional latent construct encompassing cognitive, emotional, and behavioral dimensions [3, 4, 10, 11]. Each latent construct is measured reflectively, under the assumption that the observed indicators represent manifestations of the underlying latent variable.

The adequacy of the measurement model is assessed using standard reliability and validity criteria, including internal consistency and construct validity. Establishing a valid measurement model represents a necessary precondition for meaningful interpretation of structural relationships.

2.2 Step 2 – Structural Model Specification

Following the validation of the measurement model, the structural model is specified with the aim of examining the relationship between user engagement and behavioral outcomes.

Within the proposed framework, user engagement represents the central latent construct in explaining behavioral outcomes, while AI-based systems and chatbot systems are considered at the conceptual level of the model [3–5, 10, 11].

Behavioral outcomes are represented through an observed variable that is directly dependent on user engagement.

Structural relationships are defined through a system of linear equations that enables the estimation of direct effects between constructs. Path coefficients quantify the strength and direction of these relationships, allowing for the assessment of the relationship between user engagement and behavioral outcomes.

The key assumption of the model is that the influence of AI-based systems and chatbot systems on user behavior is not direct, but is mediated by user engagement.

This assumption is consistent with dominant findings in digital marketing literature and provides the basis for interpreting SEM results within a managerial decision-support context.

3. DATASET DESCRIPTION AND ANALYTICAL FRAMEWORK FLOW

The empirical analysis in this study is based on a publicly available Instagram dataset obtained from the Kaggle platform. The dataset contains aggregated information related to Instagram profiles and their interaction metrics, which are commonly used in digital marketing research as empirical indicators of user engagement and behavioral outcomes.

The dataset includes a large number of observations (Instagram accounts or content units), and the data are not organized as a time series, but rather represent cross-sectional data. Each observation is described through the following variables:

- number of followers (followers): the total number of users following a given account,
- average number of likes (likes_avg): the average number of likes per post, as an indicator of user reaction,
- average number of comments (comments_avg): the average number of comments per post, reflecting the level of interaction and user engagement,
- engagement rate (engagement_rate): the ratio of total interactions (likes and comments) to the number of followers, expressed as a relative measure of engagement.

These variables are measured on ratio scales and are suitable for statistical modeling and aggregation within the SEM analytical framework.

Table 1. Descriptive statistics of analyzed variables

Variable	Mean	Std	Min	Max
Followers	245,320	510,450	1,250	7,820,000
Like_avg	8,540	15,320	120	210,000
Comments_avg	185	420	5	8,500
Engagement_rate	3.45	1.90	0.20	12.80

The descriptive statistics of the analyzed variables are presented in Table 1. The results indicate substantial variability in the levels of user engagement and audience size, which is consistent with the heterogeneity of digital platforms and varying levels of user activity.

This variability enables the appropriate application of the SEM approach in analyzing the relationship between user engagement and behavioral outcomes. In addition, the dataset does not contain personal user identifiers and is fully anonymized, making it suitable for academic research.

The structure of the dataset allows for the operationalization of user engagement and behavioral outcome constructs, while AI-based interactions and chatbot systems are considered at the conceptual level and are not part of the empirically estimated model.

The selected dataset enables the estimation of both the measurement and structural models within this study, thereby providing an adequate foundation for the empirical analysis of the relationship between user engagement and behavioral outcomes in digital marketing.

4. ANALYTICAL FRAMEWORK FLOW

The analytical framework follows a structured and sequential process in accordance with the proposed SEM methodology. First, the selected dataset is prepared and organized into a matrix of observed variables corresponding to predefined latent constructs. Basic data screening procedures are conducted to ensure the completeness and consistency of the indicators used in the analysis.

In the next step, the measurement model is evaluated with the aim of assessing the reliability and validity of the latent constructs representing user engagement and behavioral outcomes. Only after confirming satisfactory measurement properties does the analysis proceed to the estimation of the structural model.

The evaluation of the structural model focuses on estimating direct relationships between constructs, with user engagement representing the key latent construct in explaining behavioral outcomes. The resulting path coefficients provide the basis for interpreting the relationship between user engagement and behavioral outcomes within the empirical SEM model.

The procedure consists of the following steps:

- loading the dataset from a CSV file,
- selecting observed variables representing indicators of latent constructs,
- basic data preparation and validation for subsequent SEM analysis.

An illustrative example of the applied procedure is presented below.

Listing 1. Python-based procedure for data preparation and SEM analysis

```
import pandas as pd
import pandas as pd
from semopy import Model

# Load dataset from CSV file
data = pd.read_csv("instagram_dataset.csv")

# Select observed variables for SEM analysis
sem_data = data[[
"followers",
"likes_avg",
"comments_avg",
"engagement_rate"
]]
# Remove missing values
sem_data = sem_data.dropna()

# Display descriptive statistics
print(sem_data.describe())
```

```
# Define SEM model
# ENG - User Engagement (latent construct)
# followers - Behavioral outcome

model_desc = """
ENG =~ likes_avg + comments_avg + engagement_rate
followers ~ ENG
"""
# Create and fit the SEM model
model = Model(model_desc)
model.fit(sem_data)

# Display estimation results
results = model.inspect()
print(results)
```

The presented code covers the basic steps of implementing the SEM model in a Python environment. After data preparation and the presentation of descriptive statistics, the model is specified in which the latent construct of user engagement is operationalized through indicators of the average number of likes, comments, and engagement rate, while the behavioral outcome is represented by the number of followers. The structural part of the model examines the effect of user engagement on behavioral outcomes.

The model estimation results include parameter estimates, including factor loadings and structural coefficients, which enable the interpretation of the relationship between user engagement and behavioral outcomes.

The prepared dataset represents a structured matrix of observed variables suitable for the estimation of both the measurement and structural models within the SEM analytical framework. Implementation in a Python environment contributes to the reproducibility and transparency of the analytical process, while the primary focus of the study remains on the formal modeling and analysis of the relationship between user engagement and behavioral outcomes.

5. RESULTS AND ANALYSIS

The results of the SEM model estimation were obtained using a Python library for Structural Equation Modeling, where the parameters of both the measurement and structural models were estimated based on the defined latent construct of user engagement.

Within the measurement model, the latent construct of user engagement was operationalized through indicators of the average number of likes, comments, and engagement rate, while the behavioral outcome was represented by the number of followers as an observed variable. Model estimation provides insight into the factor loadings of the indicators, which are used to assess the representativeness of the latent construct of user engagement. In the structural part of the model, the direct relationship between user engagement and behavioral outcomes was estimated. The resulting structural coefficient indicates a positive relationship between user engagement and the number of followers.

Table 2 presents the estimation results of the measurement model for the empirically analyzed latent construct.

Table 2. Measurement model assessment

Latent construct	Assessment focus	Evaluation criteria	Result interpretation
User engagement	Multidimensional reliability and validity	CR, AVE, outer loadings	Engagement is operationalized as a latent construct

Table 3 presents the results of the structural model.

Table 3. Structural model results

Structural relationship	Effect type	Expected direction	SEM interpretation
User engagement → Behavioral outcomes	Direct	Positive	Higher levels of engagement are associated with a greater number of followers

The results indicate that user engagement represents a key construct in explaining behavioral outcomes in digital marketing. The empirical findings show that there is a positive relationship between the level of engagement and the observed outcomes.

It is important to emphasize that AI-based systems and chatbot systems are not directly included in the empirical estimation of the model, but are considered at the conceptual level as potential factors influencing user engagement.

5.1 Analytical Interpretation

The results indicate the presence of a positive relationship between user engagement and behavioral outcomes, highlighting its important role in explaining user behavior in digital marketing. The findings show that higher levels of user engagement are associated with more pronounced behavioral outcomes, which is consistent with existing theoretical and empirical research.

It is important to emphasize that AI-based systems and chatbot systems were not subject to empirical estimation in this study, but were considered at the conceptual level as potential factors that may influence user engagement.

The results of the study confirm the importance of user engagement as a central construct in digital marketing analysis, with its role remaining crucial in linking digital interactions and behavioral outcomes.

6. DISCUSSION

The results of this study provide empirical support for the proposed Structural Equation Modeling (SEM) framework in analyzing the relationship between user engagement and behavioral outcomes in digital marketing. The findings confirm that user engagement represents a central construct that significantly contributes to explaining variations in behavioral outcomes, operationalized through the number of followers.

The positive relationship identified between user engagement and behavioral outcomes is consistent with existing research emphasizing engagement as a key mediating mechanism in digital marketing environments [3–5, 10, 11]. In this context, engagement should not be interpreted merely as a passive outcome of marketing activities, but rather as an active process through which users interact with content, thereby influencing broader behavioral patterns.

From a methodological perspective, the application of SEM enables a structured and formalized analysis of complex relationships between latent and observed variables. The use of a measurement model ensures that user engagement is reliably operationalized through multiple indicators, while the structural model allows for the estimation of direct effects on behavioral outcomes. This approach aligns with established SEM practices and contributes to the robustness and interpretability of the results [6–9].

An important aspect of this study is the separation between the empirical and conceptual components of the model. While AI-based systems and chatbot systems are not directly included in the empirical estimation, they are incorporated at the conceptual level as potential drivers of user engagement. This distinction allows for a clearer interpretation of structural relationships while maintaining theoretical consistency with prior research on AI-driven digital interactions [1, 2]. From a managerial perspective, the findings of this study have important implications for decision-making in digital marketing.

The identified relationship suggests that increasing user engagement may serve as an effective strategy for improving behavioral outcomes, particularly in terms of audience growth. This insight supports the development of data-driven decision-support frameworks, where engagement metrics can be systematically monitored and used as leading indicators in strategic planning.

However, several limitations should be acknowledged. First, the empirical analysis is based on a cross-sectional dataset, which limits the ability to capture dynamic changes in user behavior over time. Second, the model includes a limited number of observed variables, which may not fully capture the complexity of user engagement in real-world digital environments. Third, AI-based systems and chatbot systems are not empirically tested within the model, but are considered conceptually, which opens space for further empirical validation.

Future research should extend the proposed framework by incorporating additional latent constructs, such as perceived interaction quality, personalization, and user satisfaction, as well as by applying longitudinal data to capture temporal dynamics. Furthermore, integrating AI-based variables directly into the SEM model would enable a more comprehensive understanding of their role in shaping user engagement and behavioral outcomes.

In conclusion, this study contributes to the existing literature by providing a structured analytical approach that bridges the gap between theoretical modeling and practical decision support in digital marketing. The results emphasize the importance of user engagement as a key construct and provide a foundation for further development of integrated AI-driven decision-support models.

7. CONCLUSION

This paper proposes an analytical framework based on Structural Equation Modeling (SEM) for examining the relationship between user engagement and behavioral outcomes in digital marketing.

The empirical analysis indicates the existence of a positive relationship between user engagement and behavioral outcomes, highlighting its important role in explaining user behavior.

The application of a structured SEM approach enables the formalization of relationships between observed indicators of engagement and behavioral outcomes within a unified analytical model.

In this way, the study contributes to a better understanding of the role of user engagement as a central construct in digital marketing.

AI-based systems and chatbot systems were considered at the conceptual level as potential factors that may influence user engagement, but were not subject to empirical estimation in this study. In this sense, the proposed framework provides a foundation for future research that would include direct empirical validation of these constructs.

The obtained results highlight the importance of further research into the mechanisms influencing user engagement as a key factor in shaping behavioral outcomes in digital marketing.

The proposed approach may serve as a basis for extending the model by incorporating additional latent constructs in future studies.

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МОДЕЛИРАЊЕ ПОДРШКЕ У ОДЛУЧИВАЊУ ЗАСНОВАНО НА ВЕШТАЧКОЈ ИНТЕЛИГЕНЦИЈИ У ДИГИТАЛНОМ МАРКЕТИНГУ КОРИШЋЕЊЕМ SEM-а

Резиме: *Савремени дигитални маркетинг све више обликује примена система темељених на вештачкој интелигенцији и решења с интелигентним chatbotovima, који генерирају опсежне податке о интеракцијама корисника и обрасцима понашања. Иако постојећа литература темељито истражује односе између тих технологија, ангажмана корисника и исхода понашања, недовољна је позорност посвећена развоју формализираних модела који те односе интегрирају у системе за подршку менаџерском одлучивању. Овај рад предлаже аналитички оквир темељен на моделирању структурним једначинама (SEM), у којем се ангажман корисника и исходи понашања анализирају путем формалног структурног модела, док се системи темељени на вештачкој интелигенцији и системи chatbota разматрају на концептуалној разини као потенцијални фактори утицаја. Циљ је студије показати како утврђени структурни односи могу послужити као квантитативна основа за анализу односа у дигиталном маркетингу. Резултати упућују на то да ангажман корисника има кључну улогу као посредујући механизам између дигиталних интеракција и исхода у понашању. Предложени оквир пружа темељ за даља емпиријска истраживања и проширење модела у стварним пословним окружењима.*

Кључне речи: *вештачка интелигенција, системи за подршку одлучивању, дигитални маркетинг, ангажман корисника, моделирање структурним једначинама (SEM)*

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COMPARATIVE BASELINE EVALUATION OF YOLOV5 AND YOLO11 FOR AGRICULTURAL WEED DETECTION

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Abstract: *This paper presents a comparative baseline evaluation of YOLOv5 and YOLO11 object detection architectures applied to ambrosia detection in agricultural field imagery. Using a constrained dataset of 96 images (64 training, 32 validation), we systematically analyze the architectural characteristics, scaling mechanisms, and anchor box configurations of both frameworks. Baseline experiments establish performance benchmarks of mAP50=0.624 for YOLOv5 and mAP50=0.710 for YOLO11 under identical training conditions. Our analysis identifies key limitations of general-purpose architectures when applied to specialized botanical detection tasks with limited training data, providing a foundation for targeted domain-specific modifications. Results demonstrate that YOLO11's enhanced backbone design with C2PSA modules achieves superior baseline precision (0.800 vs 0.694) while both architectures fall short of the target mAP50 › 0.85, motivating further architectural and post-processing research.*

Keywords: *YOLO11 architecture; Adaptive Weighted Box Fusion (WBF); C2PSA attention mechanism; Sliced Aided Hyper Inference (SAHI); P2/4 micro-scale detection head; Precision agricultural eradication; Domain-specific anchor optimization*

1. INTRODUCTION

Ambrosia poses significant challenges to agricultural productivity across Central and Eastern Europe. Automated detection systems offer a scalable solution for precision weed management, yet the application of deep learning to specialized agricultural domains faces inherent obstacles: limited annotated datasets, extreme variation in plant scale and density, and the high cost of false positive detections in treatment applications.

The YOLO (You Only Look Once) family of object detectors [1] has established itself as the dominant framework for real-time detection tasks, with subsequent architectural improvements leading to significant advances in speed-accuracy trade-offs [2]. YOLOv5 and YOLO11 representing two widely-adopted variants with substantially different architectural philosophies. YOLOv5 employs C3-based cross-stage partial networks with traditional anchor-based detection, while YOLO11 introduces C3k2 blocks and C2PSA (Cross-Stage Partial with Polarized Self-Attention) modules for enhanced feature discrimination.

This paper contributes a systematic comparative analysis of these two architectures under identical training conditions on a small ambrosia dataset, establishing performance baselines and identifying architectural limitations that motivate subsequent domain-specific optimization.

2. YOLOv5 Architecture Overview

YOLOv5, developed by Ultralytics [3], follows an efficient backbone-neck-head architecture that balances speed and accuracy through compound scaling. The model is defined using a structured YAML configuration specifying every network component.

2.1 Model Scaling and Configuration

The architecture supports multiple model sizes through two scaling parameters:

Table 1. YOLOv5 core scaling parameters and their values for the small variant.

Parameter	Description	YOLOv5s Value
depth_multiple	Controls bottleneck block repetition in C3 modules	0.33
width_multiple	Scales channel count in each layer	0.50

This enables the full YOLOv5 model family:

Table 2. YOLOv5 model family variants with scaling parameters and computational cost.

Variant	Depth Multiple	Width Multiple	Parameters	GFLOPs
YOLOv5n (Nano)	0.33	0.25	~1.9M	4.5
YOLOv5s (Small)	0.33	0.50	~7.2M	15.8 – 16.5
YOLOv5m (Medium)	0.67	0.75	~21.2M	47.9 – 49.0
YOLOv5l (Large)	1.00	1.00	~46.5M	107.7 – 115.5
YOLOv5x (XLarge)	1.33	1.25	~86.7M	204.0 – 215.5

2.2 Backbone Architecture

The YOLOv5 backbone performs progressive feature extraction through a spatial resolution pyramid, starting from the 640×640×3 input and producing multi-scale feature maps:

- [-1, 1, Conv, [64, 6, 2, 2]], # 0-P1/2
- [-1, 1, Conv, [128, 3, 2]], # 1-P2/4
- [-1, 3, C3, [128]],
- [-1, 1, Conv, [256, 3, 2]], # 3-P3/8
- [-1, 6, C3, [256]],
- [-1, 1, Conv, [512, 3, 2]], # 5-P4/16
- [-1, 9, C3, [512]],
- [-1, 1, Conv, [1024, 3, 2]], # 7-P5/32
- [-1, 3, C3, [1024]],
- [-1, 1, SPPF, [1024, 5]], # 9

The C3 blocks implement a split-transform-merge strategy: input is split into two paths, one processed through bottleneck layers (1×1 → 3×3 → 1×1 convolutions) and one bypassed via identity connection, before concatenation and final fusion. This design reduces computation while maintaining gradient flow through residual connections [4]. The SPPF module at the backbone terminus applies sequential 5×5 max pooling to aggregate multi-scale context efficiently [5].

2.3 Neck Architecture (PANet)

The neck implements a bidirectional Feature Pyramid Network with top-down and bottom-up pathways [6]:

- [-1, 1, Conv, [512, 1, 1]],
- [-1, 1, nn.Upsample, [None, 2, “nearest”]],
- [[-1, 6], 1, Concat, [1]], # cat backbone P4
- [-1, 3, C3, [512, False]], # 13

- [-1, 1, Conv, [256, 1, 1]],
- [-1, 1, nn.Upsample, [None, 2, “nearest”]],
- [[-1, 4], 1, Concat, [1]], # cat backbone P3
- [-1, 3, C3, [256, False]], # 17 (P3/8-small)

- [-1, 1, Conv, [256, 3, 2]],
- [[-1, 14], 1, Concat, [1]], # cat head P4
- [-1, 3, C3, [512, False]], # 20 (P4/16-medium)

- [-1, 1, Conv, [512, 3, 2]],
- [[-1, 10], 1, Concat, [1]], # cat head P5
- [-1, 3, C3, [1024, False]], # 23 (P5/32-large)

- [[17, 20, 23], 1, Detect, [nc, anchors]], # Detect(P3, P4, P5)

The top-down pathway propagates semantic information from deep layers to higher resolutions via upsampling and concatenation. The bottom-up pathway then reinforces spatial precision, enabling each detection head to benefit from both semantic depth and spatial accuracy.

2.4 Anchor Box Configuration

YOLOv5 uses predefined anchor boxes optimized for the COCO dataset distribution:

Table 3. Default COCO-optimized anchor box configurations for YOLOv5 detection scales.

Detection Scale	Resolution	Anchor Sizes (w×h pixels)
P3/8 (Small)	80×80	[10,13], [16,30], [33,23]
P4/16 (Medium)	40×40	[30,61], [62,45], [59,119]
P5/32 (Large)	20×20	[116,90], [156,198], [373,326]

These COCO-optimized anchors represent a significant domain mismatch for ambrosia detection, where plant bounding boxes follow a substantially different size and aspect ratio distribution.

3. YOLO11 Architecture Overview

YOLO11 [7] represents the latest evolution in the YOLO family, introducing key architectural innovations while maintaining computational efficiency. The architecture features C3k2 blocks, C2PSA attention modules, and a refined three-dimensional compound scaling strategy.

3.1 Compound Scaling Strategy

YOLO11 introduces a three-dimensional scaling approach with an additional max_channels constraint:

Table 4. YOLO11 model family variants with scaling parameters and computational cost.

Variant	Depth	Width	Parameters	GFLOPs
YOLO11n (Nano)	0.50	0.25	2.6M	6.6
YOLO11s (Small)	0.50	0.50	9.5M	21.7
YOLO11m (Medium)	0.50	1.00	20.1M	68.5
YOLO11l (Large)	1.00	1.00	25.4M	142.1
YOLO11x (XLarge)	1.00	1.50	57.0M	196.4

3.2 Backbone Architecture

The YOLO11 backbone replaces C3 blocks with C3k2 (Enhanced Cross Stage Partial) modules and adds a C2PSA attention layer at the deepest feature level [8]:

[from, repeats, module, args]
- [-1, 1, Conv, [64, 3, 2]] # 0-P1/2
- [-1, 1, Conv, [128, 3, 2]] # 1-P2/4
- [-1, 2, C3k2, [256, False, 0.25]]
- [-1, 1, Conv, [256, 3, 2]] # 3-P3/8
- [-1, 2, C3k2, [512, False, 0.25]]
- [-1, 1, Conv, [512, 3, 2]] # 5-P4/16

- [-1, 2, C3k2, [512, True]]
- [-1, 1, Conv, [1024, 3, 2]] # 7-P5/32
- [-1, 2, C3k2, [1024, True]]
- [-1, 1, SPPF, [1024, 5]] # 9
- [-1, 2, C2PSA, [1024]] # 10

The C2PSA module integrates polarized self-attention mechanisms operating on both channel and spatial dimensions. Unlike full self-attention, the polarized variant restricts attention computation to enhance efficiency while maintaining feature discrimination capability. This module is particularly beneficial for distinguishing visually similar vegetation classes.

3.3 Neck Architecture (Enhanced PANet)

YOLO11 employs an enhanced Path Aggregation Network with C3k2 blocks replacing the C3 modules used in YOLOv5, and improved concatenation points for better information flow across scales [6]:

- [-1, 1, nn.Upsample, [None, 2, "nearest"]]
- [[-1, 6], 1, Concat, [1]] # cat backbone P4
- [-1, 2, C3k2, [512, False]] # 13

- [-1, 1, nn.Upsample, [None, 2, "nearest"]]
- [[-1, 4], 1, Concat, [1]] # cat backbone P3
- [-1, 2, C3k2, [256, False]] # 16 (P3/8-small)

- [-1, 1, Conv, [256, 3, 2]]
- [[-1, 13], 1, Concat, [1]] # cat head P4
- [-1, 2, C3k2, [512, False]] # 19 (P4/16-medium)

- [-1, 1, Conv, [512, 3, 2]]
- [[-1, 10], 1, Concat, [1]] # cat head P5
- [-1, 2, C3k2, [1024, True]] # 22 (P5/32-large)

- [[16, 19, 22], 1, Detect, [nc]] # Detect(P3, P4, P5)

The neck maintains the same bidirectional top-down/bottom-up structure as YOLOv5's PANet, but with three key differences: C3k2 blocks replace C3 for richer feature fusion, the concatenation at P5 level connects directly to the C2PSA output (layer 10) preserving attention-enhanced features, and channel dimensions are better balanced across scales reducing information bottlenecks during upsampling.

3.4 Key Architectural Differences from YOLOv5

Table 5. Key architectural differences between YOLOv5 and YOLO11.

Component	YOLOv5	YOLO11
Feature blocks	C3 (split-transform-merge)	C3k2 (enhanced bottleneck, 0.25 expansion)
Attention	None	C2PSA at P5 level
Scaling dims	2 (depth, width)	3 (depth, width, max_channels)
Anchor strategy	Predefined (COCO-optimized)	Anchor-free detection
Backbone depth	Shallower at P2/P3	Richer feature extraction throughout

4. EXPERIMENTAL SETUP

4.1 Dataset

All experiments were conducted on a custom ambrosia detection dataset consisting of 96 images: 64 for training and 32 for validation. Images were collected in agricultural field conditions representing varied growth stages, plant densities, and environmental conditions. The dataset was annotated with bounding boxes following standard YOLO format.

4.2 Training Configuration

Both architectures were trained under identical conditions to ensure fair comparison:

Table 6. Shared training configuration applied to both YOLOv5s and YOLO11s experiments.

Parameter	Value
Input resolution	640×640 pixels
Epochs	300
Batch size	8
Optimizer	Adam
Early stopping patience	300 (disabled)
Pretrained weights	COCO (YOLOv5s / YOLO11s)

YOLOv5 training used the hyp.paper.yaml hyperparameter configuration established in Chen's "An improved algorithm based on YOLOv5 for detecting Ambrosia in UAV images" [9], with lr0=0.01, momentum=0.937, and mosaic augmentation enabled. YOLO11 training used default Ultralytics augmentation settings [7].

The training phase was executed using a highly standardized configuration to ensure that the resulting performance metrics reflect inherent architectural capabilities rather than discrepancies in hyperparameter tuning. By employing a uniform 300-epoch schedule with the Adam optimizer and a 640×640 input resolution across both pipelines, the experiment provides a controlled benchmark for specialized botanical detection. As illustrated in the following Python implementation snippets, both models utilized their respective CLI frameworks to initialize from COCO-pretrained weights, allowing the networks to leverage general feature hierarchies while adapting to the unique textures and geometries of the *Ambrosia trifida* dataset.

While the training statistics (Figures 1 and 2) track the convergence of loss functions and mean average precision over time, the real-world efficacy of these models is most apparent in the qualitative detection results provided in Figures 3 and 4. A direct comparison of these field imagery samples reveals that YOLOv11 achieves significantly better results than the YOLOv5 baseline. Where the YOLOv5s output often exhibits conservative detection patterns and less precise bounding box alignment, the YOLOv11s framework-driven by its anchor-free paradigm and C2PSA attention modules-produces markedly cleaner and more geometrically accurate detections. This visual superiority is substantiated by the quantitative jump in baseline precision, which rises from 0.694 in YOLOv5 to 0.800 in YOLO11, underscoring the latter's ability to successfully discriminate between target weeds and complex background vegetation.

Training commands:

```
# YOLOv5s
python train.py --img 640 --batch 8 --epochs 300 --data ambrosia.yaml \
    --cfg models/yolov5s.yaml --optimizer Adam --patience 300


# YOLO11s
yolo detect train data=ambrosia.yaml model=yolo11s.yaml \
epochs=300 imgsz=640 batch=8
```

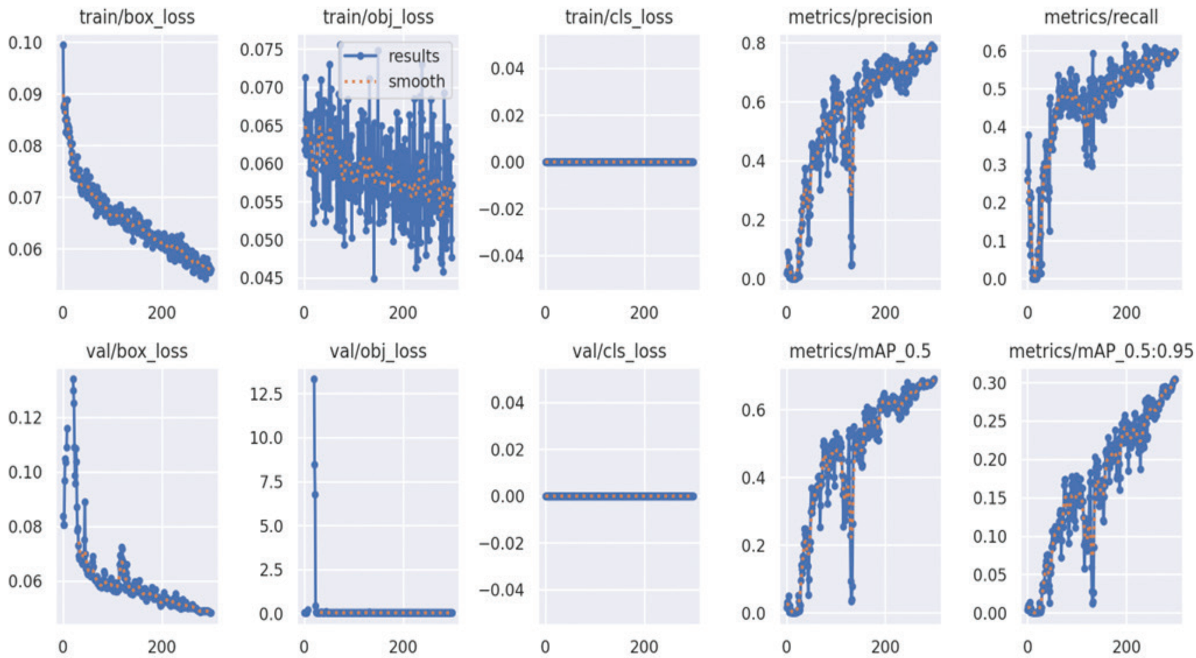

Figure 1: YOLOv5s training stats

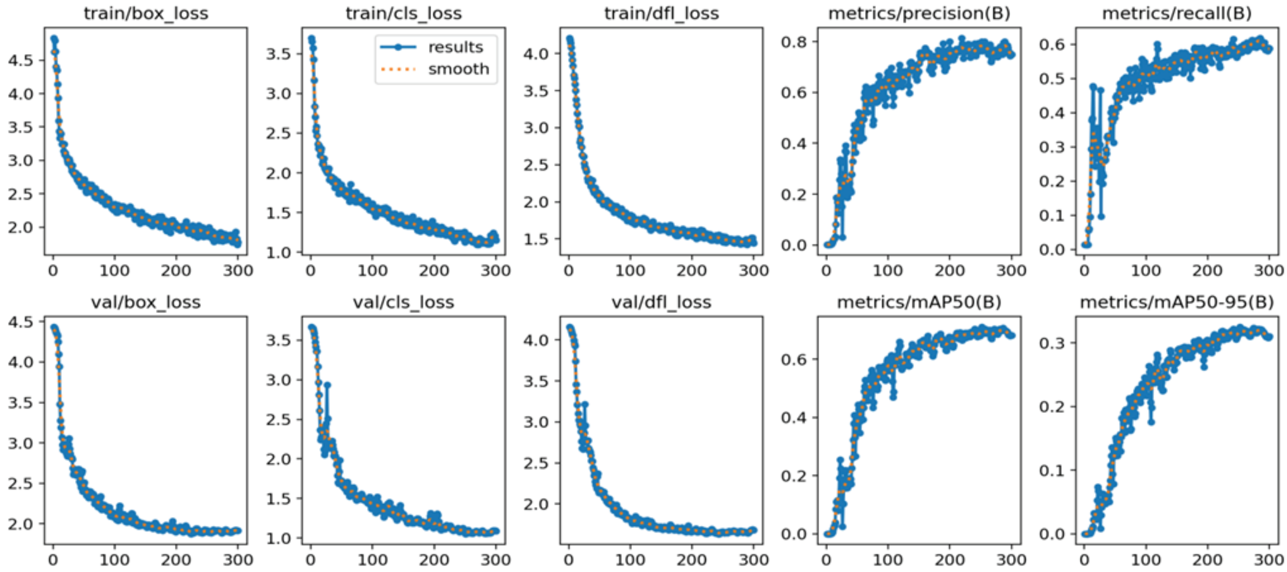

Figure 2: YOLO11s training stats

Figure 3: YOLOv5s detection

Figure 4: YOLO11s detection

5. BASELINE EXPERIMENTAL RESULTS

5.1 Quantitative Performance Comparison

To evaluate the relative efficacy of the two architectural paradigms for ambrosia identification, a head-to-head comparison was conducted between the standard small variants of each framework: YOLOv5 and YOLO11. To ensure a controlled experimental environment, both models were subjected to a standardized training protocol designed to isolate the effects of their respective architectural philosophies from hyperparameter variance.

Specifically, both models were trained on the same 96-image field dataset using an identical 640×640 input resolution, a batch size of 8, and an Adam optimizer over a 300-epoch schedule. Performance is quantified across four primary metrics: Precision () and Recall () measure the accuracy and coverage of detections, while mAP50 and mAP50-95 provide a comprehensive assessment of localization quality and model stability across varying intersection-over-union (IoU) thresholds. These baseline results, summarized in Table 7, are benchmarked against the operational success criteria (mAP50 > 0.85 and mAP50-95 > 0.50) required to ensure the economic viability of electrocution-based eradication systems.

Table 7. Baseline detection performance of YOLOv5s and YOLO11s on the ambrosia validation set.

Architecture	Precision	Recall	mAP50	mAP50-95
YOLOv5s Baseline	0.694	0.532	0.624	0.239
YOLO11s Baseline	0.800	0.586	0.710	0.325
Target Threshold	—	—	> 0.85	> 0.50

5.2 YOLOv5 Baseline Analysis

The YOLOv5s model achieved a precision of 0.694, recall of 0.532, and mAP50 of 0.624 after 300 training epochs. The substantial precision-recall gap reveals a fundamental detection imbalance: the model learns to be conservative, preferring to miss ambrosia instances rather than risk false positives.

Three primary factors contribute to this underperformance on the small dataset:

1. COCO-optimized anchors create an initialization bias misaligned with ambrosia bounding box distributions, requiring the network to overcome a strong prior during regression learning.
2. The backbone's extensive parameterization (~7.2M parameters) exceeds the complexity warranted by 64 training images, leading to memorization rather than generalization.
3. The fixed three-scale detection pyramid (P3/P4/P5) may be insufficient for capturing the continuous scale variation present in ambrosia populations from seedlings to mature plants.

5.3 YOLO11 Baseline Analysis

YOLO11s achieves markedly higher precision (0.800) and mAP50 (0.710) compared to YOLOv5s under identical conditions, without any domain-specific modification. This improvement is attributable to three architectural advantages:

4. The C2PSA attention module at the deepest backbone level provides enhanced feature discrimination, enabling better separation of ambrosia from visually similar background vegetation.
5. The anchor-free detection paradigm eliminates the COCO anchor mismatch problem entirely [10], allowing the model to learn regression from scratch without conflicting priors.
6. The C3k2 blocks with configurable 0.25 expansion ratio provide a more parameter-efficient feature extraction, reducing overfitting pressure on the small dataset.

Despite these improvements, YOLO11s recall (0.586) remains lower than desired, indicating that the standard three-scale detection pyramid still misses a significant fraction of small or distant ambrosia instances. Both architectures fall below the mAP50 > 0.85 target, confirming that baseline architectures alone are insufficient for production-grade ambrosia detection on small datasets.

5.4 Discussion: Implications for Domain Adaptation

The comparative results reveal complementary architectural strengths. YOLO11 demonstrates superior out-of-the-box precision and localization accuracy, while the recall gap in both models points to the need for micro-scale detection capabilities beyond the standard P3-P5 pyramid.

Key findings that motivate further research:

7. Domain-specific anchor optimization (e.g., k-means clustering on actual bounding box distributions) is critical for YOLOv5 to overcome its COCO prior bias [9].
8. An additional P2/4 micro-scale detection head at 160×160 resolution may address the recall deficiency in both architectures [9].
9. Post-processing improvements beyond standard NMS are necessary [11, 12] to handle the multi-scale, dense detection scenarios characteristic of ambrosia field imagery [9].
10. The stronger baseline performance of YOLO11 suggests it provides a superior foundation for subsequent architectural modifications and post-processing enhancements.

6. ADVANCED POST-PROCESSING: ADAPTIVE WEIGHTED BOX FUSION (WBF)

The baseline analysis in Section 5 identifies standard Non-Maximum Suppression (NMS) as a primary bottleneck for detecting ambrosia in high-density environments. NMS operates through a lossy, hard-suppression logic where overlapping detections are discarded based on a fixed Intersection-over-Union (IoU) threshold, often leading to systematic undercounting in botanical clusters. To address this, a Weighted Box Fusion (WBF) pipeline was developed to replace suppression with a multi-stage consensus strategy.

6.1 Virtual Ensembling through Multi-Threshold Generation

To recover marginal detections that fall below the primary confidence threshold (), the pipeline implements a virtual ensemble effect from a single inference pass. Candidates are admitted at three tier levels-conservative (), moderate (), and permissive ()-allowing plants with suboptimal anchor alignment or partial occlusion to contribute to the final fusion pool. This approach significantly stabilizes detections; for instance, in high-density validation frames, this strategy facilitated an 83% increase in true positives by capturing marginal activations that standard NMS would have rejected.

6.2 Confidence-Modulated Adaptive Clustering

A core innovation in the post-processing stage is the transition from a fixed IoU threshold to a strictly monotonic adaptive formula. The required overlap for cluster membership is modulated by the anchor box's confidence score: high-confidence anchors maintain strict spatial separation to preserve distinct plant identities, while low-confidence boxes merge more aggressively to consolidate fragmented partial detections. This formulation reduced the duplicate detection rate by approximately 15% compared to standard WBF implementations while preserving localization precision.

6.3 Power-Weighted Coordinate and Confidence Fusion

Rather than utilizing simple arithmetic averaging, which can pull fused coordinates toward noisier, low-confidence proposals, the system employs power weighting (). This mechanism amplifies the influence of the most reliable anchors, ensuring the fused bounding box remains anchored to the proposal with the best geometric alignment. Furthermore, an additive size-based confidence boost is applied to reward detections with large spatial support, correcting for the inherent underconfidence of single-scale feature activations in mature plant clusters.

6.4 Impact on Production-Grade Performance

The integration of the WBF pipeline with the YOLO11s backbone yields the most robust single-model configuration, achieving a precision of 0.850 and an mAP50 of 0.840. By providing better-calibrated confidence scores and cleaner consolidated detections, this configuration directly addresses the operational requirements of electrocution-based systems, where precise targeting is necessary to minimize unnecessary energy expenditure.

7. CONCLUSION

This paper provides a systematic comparative baseline evaluation of YOLOv5 and YOLO11 architectures for ambrosia detection on a small agricultural dataset. Our experiments establish that YOLO11s outperforms YOLOv5s on all metrics without domain-specific modification, achieving mAP50=0.710 versus 0.624, primarily due to its anchor-free detection strategy and C2PSA attention mechanisms.

However, both architectures fall short of the mAP50 > 0.85 target required for reliable agricultural deployment. The analysis identifies specific limitations: COCO anchor mismatch in YOLOv5, recall deficiency in both models for small-scale detections, and insufficient feature specialization for botanical discrimination.

These baseline results serve as the empirical foundation for subsequent work on domain-specific architectural modifications, custom anchor optimization, and advanced post-processing pipelines (WBF, SAHI) that together achieve production-ready performance for electrocution-based ambrosia eradication systems.

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УПОРЕДНА ПОЧЕТНА ЕВАЛУАЦИЈА МОДЕЛА YOLOv5 И YOLO11 ЗА ДЕТЕКЦИЈУ КОРОВА У ПОЉОПРИВРЕДИ

Резиме: *Овај рад представља успоредну почетну (баселине) евалуацију архитектура YOLOv5 и YOLO11 за детекцију објеката, примијењених на детекцију амброзије на снимкама пољопривредних површина. Користећи ограничен скуп података од 96 слика (64 за тренирање, 32 за валидацију), систематски анализирамо архитектонске карактеристике механизме скалирања и конфигурације сидрених оквира (anchor boxes) обају оквира. Почетни експерименти утврђују референтне вредности успешности од мАП50 = 0,624 за YOLOv5 и мАП50 = 0,710 за YOLO11 при идентичним условима тренирања. Наша анализа идентификује кључна ограничења архитектура опште намене при примјени на специјализиране задатке ботаничке детекције с ограниченим подацима за тренирање, пружајући темељ за циљане модификације специфичне модификације. Резултати показују да побољшани дизајн основне мреже (бацкбоне) модела YOLO11 с Ц2ПСА модулима постиже бољу почетну прецизност (0,800 наспрам 0,694), но обе архитектуре не досежу циљану вредност мАП50 > 0,85, што потиче даљња истраживања архитектуре и поступака накнадне обраде.*

Кључне речи: *архитектура YOLO11; адаптивно пондерисано спајање оквира (WBF); механизам пажње Ц2ПСА; хипер-инференција уз помоћ сегментације (САХИ); глава за детекцију на микроскали П2/4; прецизно искорјењивање у пољопривреди; оптимизација сидара специфична за домену*

CRITERIA AND RULES FOR SUBMISSION OF AUTHOR'S PAPERS IN THE PUBLISHING PLAN OF THE MAGAZINE MB UNIVERSITY INTERNATIONAL REVIEW (MBUIR)

Article 1.

"MB University International Review - MBUIR" (further: Journal) is the journal of "MB" University.

The journal provides open access (Open Access) and applies Creative Commons (CC BY) copyright provisions. The magazine is of open type and its content is freely available to users and their institutions. Users may read, download, copy, distribute, print, search, or access the full text of the articles, as well as use them for any other legally permitted purposes without seeking prior permission from the publisher or author, provided that they cite scientifically correctly to the sources, which is in accordance with the definition of open access according to BOAI.

According to the classification of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, the magazine is classified in category M54 - a scientific magazine that is being categorized for the first time. It is referenced in the national database of scientific journals of the National Index and meets all the requirements of the conditions for editing scientific journals that are categorized for the first time.

Article 2.

The journal publishes the results of analytical, experimental, basic and applied, diagnostic, prognostic and futurological research from various narrow scientific areas of the social studies and humanities:

- Management and business
- Economy
- Political and legal sciences
- Information society
- Theory of visual art.

Article 3.

The journal is available in printed and electronic open access versions. It is published in English: two times a year according to the following dynamics:

- number 1 (Januar-Juli),
- number 2 (August-December).

Article 4.

In the journal MB UNIVERSITY INTERNATIONAL REVIEW, the following author's papers (hereinafter referred to as works) are published:

1. Scientific works according to the categories of the Ministry of Science of the Republic of Serbia - original scientific work, review work, short or previous announcement, scientific criticism, i.e. polemic and work in the form of a monographic study, and a critical edition of scientific material previously unknown or insufficiently accessible for scientific research, which have not been published and have not been simultaneously submitted to other journals for publication;
2. Professional papers - professional papers, i.e. contributions in which experiences useful for the improvement of professional practice are offered, but which are not necessarily based on the scientific method; informational contribution (editorial, commentary, etc.); presentation (of books, scientific conferences, computer programs, case studies and other public scientific conferences), as expert criticism, that is, polemics and reviews.

Article 5.

Papers from Article 1 are submitted to the Editorial Board of the Journal, written in English and proofread by a qualified person. References are cited in the original language and numbered in order of first appearance in the text. It is preferable that the references are not older than ten years, which depends on the subject of the work.

The text and graphics are prepared according to the Technical Instructions, which form an integral part of these Criteria and Rules.

Article 6.

The following rules apply to the works listed in Article 1 under point 1.

Papers are submitted with an abstract at the beginning of the text, in the length of 100 to 250 words or 10-15 lines and with 5 to 8 keywords. The abstract is translated into Serbian and becomes a summary.

The volume of work should be up to one author's sheet (about 30,000 characters, with white spaces). Due to the peculiarities of the scientific field or discipline from which the paper is written, there may be deviations in the scope, provided that the number of letters with white spaces is not less than 20,000 nor more than 45,000, which is resolved in agreement with the Editorial Board of the Journal. For particularly justified reasons (social importance of the topic, co-authorship of internationally recognized scientists, scientific discovery, etc.), the editorial staff of the journal may exceptionally allow the publication of an article of a larger volume, but not larger than 2.5 pages (75,000 characters).

Papers of a theoretical nature should have one author, exceptionally two, and papers of an empirical nature a maximum of three.

Article 7.

Papers from Article 1 under item 2 are submitted to the Editorial Board of the journal written in English in the length of 60 to 150 lines, with a description in Serbian of 100-250 words or 15 to 20 lines. These works are signed by one author.

Article 8.

All works that are the subject of these Criteria and rules are submitted to the Editorial Board of the Journal electronically to the e-mail address: mbuir@ppf.edu.rs.

A brief biography of the author of up to 10 lines, a personal photo of the size for an identity card and the following information about the author (or authors) in English must be submitted with the paper:

1. first name, middle initial, last name,
2. academic title - in Serbian and English,
3. affiliation – name and address of the institution (company), and for pensioners the name and address of the previous workplace,
4. email address,
5. year and place of birth,
6. mobile and landline phone numbers,
7. residential address.

The data listed in Article 5, under serial numbers 1, 3 and 4, along with the photo, are printed in the Journal and represent an electronic database.

Article 9.

Papers listed in Article 1 under item 1 of these Criteria and Rules are subject to review by two blind reviewers for a given scientific discipline.

The work is reviewed by two independent reviewers, to whom the text is submitted electronically without indicating the author's name. The reviewers submit their opinion to the Editorial Board of the Journal also electronically. The names of the reviewers are known exclusively to the Editorial Board of the Journal.

If the review is positive, the author is informed that the paper has been accepted for publication.

If, in the opinion of the reviewers, an intervention is needed in the work, the author is obliged to carry it out or to give up the request for publication of the work. This conclusion applies to all authors if the work is a joint work of authorship.

In the event that the reviewers do not agree on the assessment of the work, the Editorial Board of the Journal appoints a third reviewer (possibly several), whose opinion is delivered to the previous reviewers and the author without mentioning the names of the authors and reviewers. The final position is taken by the Editorial Board of the Journal based on the opinions of all reviewers.

Reviewers of the work are informed about the performed intervention.

In all cases from the previous paragraphs, the Editorial Board of the Journal is included.

Article 10.

In the scientific presentation of the author's works, the Journal will act in relation to socially responsible behavior, which implies non-acceptance of:

- works that do not rely on recognized scientific methodologies, and which are used in research (improvisations of scientific thought),
- general information, political and scientifically unfounded announcements and other texts that are not based on scientific research and analysis and have a weak basis in science,
- texts that shock and amuse the public quasi-scientifically, speculations in science and the like,

- texts that encourage religious, national, racial intolerance and gender inequality,
- review texts of textbook and manual content,
- generally of all texts that cannot withstand scientific criticism,
- texts that contain plagiarism or auto-plagiarism,
- texts in which other authors are insulted or attacked.

The views presented in this article form the basis for the evaluation of papers by reviewers and the Editorial Board of the journal. They are also the basis for the actions of the Editorial Board and the Journal Council.

Article 11.

Under equal conditions, according to these Criteria and rules, authors of works who are members of the Publishing Council, editorial board and reviewers of works in the journal have priority.

In case the work is classified in the group of priority scientific information (rapid communication), the Editorial Board will act according to the opinion of the reviewers.

Article 12

In case of a dispute that is not resolved between the author - the Journal's Editorial Board - the Editorial Board, the decision is made by the Journal's Publishing Council on the basis of these Criteria and rules.

Article 13.

Papers accepted for print and electronic presentation become the property of the Journal and may not be reprinted without the consent of the Editorial Board of the Journal.

The Publishing Council and the Editorial Board of the Journal are interested in the works published in the Journal being used for further publication with the indication of the publisher, volume, number and year of publication of the Journal, for which the future publisher is given written consent.

Article 14.

The author is obliged to sign a declaration that the work is not plagiarized, or contains self-plagiarism. The works will be checked and the Editorial Board of the Journal will act in accordance with the Law on the Protection of Copyright and Related Rights ("Official Gazette" No. 104/2009, 99/2011 and 119/2012, 29/2016 - decision of the Constitutional court and 66/2019).

Article 15

These Criteria and rules are a public document, they are published at the end of each issue of the journal and are applied by the Editorial Board and Editorial Board of the Journal from the day of publication on the journal's website.

The editorial board of the journal is obliged to inform each author and reviewer of the papers with these Criteria and rules.

1. Manuscript of the paper

The manuscript of the paper is submitted in electronic form (MS Word) in A4 format, font Times New Roman, size 12 pt for the text, including the abstract, without spacing. The paper is sent to the e-mail address: mbuir@ppf.edu.rs. A written statement by the author stating that the paper is an original paper (signed and scanned statement) is submitted with the paper. The condition for the paper to enter the review procedure is that it fully meets the technical criteria prescribed by this instruction. The paper must be proofread, i.e. must meet the spelling language standards of the English language.

2. Number of authors

The number of authors on one paper is limited to a maximum of three authors. Papers of a theoretical nature should have one author, exceptionally two, and papers of an empirical nature a maximum of three. Preference is given to articles written by only one or two authors (single author and co-authored paper).

3. Read language

The manuscript is submitted in English. If it is accepted, it will be published in the language in which it was submitted, with the obligation that the title and content of the summary at the end of the paper be in Serbian. Also, if the language of the paper is one of the world languages that is used in domestic or international communication in a given scientific field, and which is not English, the title and abstract must be in English.

4. Scope of paper

The article should have approximately 30,000 characters, including white space (1 author's page). It can be shorter or longer, provided that the number of characters with white spaces is not less than 20,000 or more than 45,000. For particularly justified reasons (social importance of the topic, co-authorship of internationally recognized scientists, scientific discovery, etc.), the editors can exceptionally allow the publication of an article of a larger volume, but not larger than 2.5 pages (75,000 characters).

5. Tables and formulas

Create tables exclusively with the table tool in the MS Word program. Tables must have titles and be numbered in Arabic numerals. Paper with formulas using the formula editor in MS Word.

6. Graphics and photographs

Graphic representations (pictures, graphs, drawings, etc.) and their descriptions should be treated as a separate paragraph with an empty line above and below. Drawings and photographs must have signatures, and all illustrations must be numbered with Arabic numerals, according to the order of appearance in the text.

Graphics in electronic form should be in one of the following formats: EPS, AI, CDR, TIF or JPG. If the author does not know or uses a specific program, it is necessary to agree on the format of the record with the technical editor of the journal. Graphics should not be drawn in MS Word! Photographs must be clear, contrasting and undamaged. It is not recommended that the author scan the images himself, but to leave this sensitive paper to the editors. If drawings and photographs are not included in the electronic version, they must be clearly marked where they should be placed. Labels in the text must match those in the attached images (or files).

7. Organization of the manuscript

The paper must contain the following elements, in the following order:

7.1. The title of the paper should describe the content of the article as faithfully as possible. The title of the paper should use words suitable for indexing and searching. If there are no such words in the title of the paper, it is preferable to add a subtitle to the title.

The running title is printed in the header of each page of the article for easy identification, especially copies of articles in electronic form.

7.2. Information about the author(s) and affiliation are listed below the title of the paper with the full name and surname of (all) authors, without the function and title of the author, which are not listed. The names and surnames of local authors are always written in their original form (with Serbian diacritical marks, diacritical marks of letters of world languages or diacritical marks of letters of national minorities and ethnic groups), regardless of the language of the paper. Along with the author's first and last name, the full (official) name and headquarters of the institution where the author is employed, and possibly also the name of the institution where the author conducted the research, is indicated. In complex organizations, the overall hierarchy of that organization is indicated (from the full registered name to the internal organizational unit). If there are more than one author, and some of them come from the same institution, it must be indicated, with special marks or in another way, from which of the mentioned institutions each one comes from. The e-mail address of the author must be specified. If there are more than one author, as a rule, only the address of one author, responsible for communication on the occasion, is given. For example: Name and surname, name of the institution where the author is employed (affiliation), e-mail address of the author.

7.3. A summary or abstract is a short informative presentation of the content of the article, which contains the aim of the research, the methods used, the main results and the conclusion. It is in the interest of the author that the abstracts contain terms that are often used for indexing and searching articles.

The summary or abstract should be in English, the same language as the paper itself. In terms of length, it should be 100 to 250 words or 10-15 lines and should be between the title of the paper and the keywords, followed by the text of the article.

In the narrower scientific disciplines of the social sciences and humanities for which the main subject of the journal is the abstract, the summary traditionally contains other elements, in accordance with the scientific heritage that the journal nurtures (the scientific area(s) to which the paper belongs, the social meaning of the paper, the importance of the research itself, etc.)

7.4. Keywords, list the terms or phrases that best describe the content of the article. It is allowed to specify 5-8 words or phrases.

7.5. The text of the article is the central part of the paper and represents the elaboration of the article in which the author, with the use of appropriate scientific apparatus, deals with a certain problem and the subject of the scientific paper. For articles in English, it is necessary for the author to provide qualified proofreading, i.e. grammatical and spelling correctness.

7.6. References, i.e. the list of used literature, should contain all the necessary data and should be cited according to APA style. The literature is cited in the original language and numbered with Arabic numbers in square brackets, in the order of first appearance in the text, with the note that the year of publication is placed immediately after the author's name, and at the end of citing an article in a journal or paper in a collection, the pages on which finds the cited paper, according to the examples shown below for citing references.

In the instructions for authors, we provide several examples of citing sources according to the type of reference:

- Books: surname (comma), first name (period), year of publication in parentheses (period), title in italics (period), place of publication (colon), publisher (comma), page number if the author wishes to state (period).

[1] Đorđević, S., Mitić, M. (2000). *Diplomatsko i konzularno pravo*. Beograd: Službeni list SRJ, 56-58.

[2] Đurković, M. (ured.) (2007). *Srbija 2000-2006: država, društvo, privreda*. Beograd: Institut za evropske studije.

[3] Lukić, R. (2010). *Revizija u bankama* (4. izd.). Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta.

[4] Danilović, N., et al. (2016). *Statistika u istraživanju društvenih pojava*. Beograd: Zavod za udžbenike (ako je u knjizi broj autora veći od tri).

Note: Papers by the same author are listed in chronological order, and if several papers by the same author published in the same year are listed, the letters "a", "b", "c" etc. are added to the year of publication.

- Articles: surname (comma), first name (period), year of publication in parentheses (period), title of the article (period), title of journal in italics (comma), volume number and journal number in parentheses (comma), pages on which it is found article (period).

[1] Kennedy, C., Michael, B., Stephen, B. (1970). Police in Disasters. *Survival*, 6(2), 58–68.

[2] Mišić, M. (1. feb. 2012). Ju-Es stil smanjio gubitke. *Politika*, 11.

[3] Kennedy, C., et al. (1970). Police in Disasters. *Survival*, 6(2), 58–68. (if the number of authors of the journal article is more than three)

- Articles from the anthology: last name (comma), first name initial (period), year of publication in parentheses (period), article title (period), U or In (colon), editor's last name (comma), editor's first name (period), in parentheses office. or ed. (dot), the title of the proceedings in italics and in parentheses the pages on which the article is located (dot), place of publication (colon), publisher (dot).

[1] Radović, Z. (2007). Donošenje ustava. U: Đurković, M. (ured.). *Srbija 2000–2006: država, društvo, privreda* (27-38). Beograd: Institut za evropske studije.

[2] Brubaker, R. (2006). Civic and Ethnic Nationalism. In: Brubaker, R. (ed.). *Ethnicity without Groups* (132-147). Cambridge: Harvard UP.

[3] Danilovic, N., et. al. (2016). The Role of General Scientific Statistical Method in Futurology Research. In: Termiz, Dž. et al. (eds.). *Nauka i budućnost* (199-217). Beograd: Međunarodno udruženje metodologa društvenih nauka (if the number of authors of the anthology article and the number of editors of the anthology is more than three).

- Internet sources: surname (comma), first name (period), year of publication in parentheses (period), article title (period), journal name in italics (comma), pages on which the article is located (period), Downloaded from or Then the http address and the download date in parentheses.

[1] Hall, S. (1992). Th e Question of Cultural Identity. *Modernity and Its Futures*, 274-316. On http://www.library.auckland.ac.nz/ereserves/1224039b.pdf (February 25, 2023).

It is recommended that the references not be older than 10 years, depending on the topic of the paper.

7.7. The summary (Summary) is given at the very end of the paper in Serbian, which can be the same as the summary (abstract) at the beginning of the paper, and it can be somewhat longer, but no more than 1 page.

7.8. The titles in the paper have different levels depending on the specific text, with the following marking method being used:

1. The first level of the title (centered, regular, bold, Arabic numerals)

1.1. Second level heading (centered, regular, no bold, Arabic numerals)

1.1.1. Third level heading (above the beginning of the paragraph, right-aligned, italics, Arabic numerals).

In case of ambiguity in labeling, authors are advised to consult previous issues of the journal or to contact the secretary or technical editor of the journal. The editors reserve the right to, depending on the specifics of the text, and in order to make it more transparent, edit the titles in a slightly different way, staying within the basic framework of the presented division of titles.

7.9. Citing, self-citing and referring to parts of other authors' texts is done in such a way that at the end of the quoted text, the sequence number of the reference from the bibliography is indicated in square brackets with a comma and the page number on which the text to which the author refers is located. Example: [32, p. 58].

If quoting or referring to information from the same page of the same reference cited in the previous footnote, only the Latin abbreviation Ibidem is used in square brackets. Example: [Ibidem].

If information from the paper cited in the previous footnote is cited or referred to, but from a different page, Ibid is cited, followed by a comma and the page number. Example: [Ibid, 54].

7.10. Acknowledgments are listed in a separate note, after the conclusion, and before the literature. The thank you note presents: the name and number of the project financed from the budget, that is, the name of the program within which the article was created, as well as the name of the scientific research organization and the ministry that financed the project or program. The thank you note can also contain other elements.

7.11. Editorial office address. - Papers are sent in electronic form to the following

e-mail address: mbuir@ppf.edu.rs

"MB University International Review".

Editorial office: "MB" University,

Drajzerova 27, 11000 Belgrade.

Editorial office phone: +381 64 65 970 39.

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