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MANAGEMENT TOOLS FOR THE PUBLIC-PRIVATE PARTNERSHIP MODEL OF CONSTRUCTION ENTERPRISES

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Abstract. The article explores the mechanisms and challenges of applying public-private partnership (PPP) in strategic management of construction enterprises in Ukraine. It analyzes the impact of globalization and liberalization on the effectiveness of construction firms and seeks ways to optimize PPPs to ensure their adaptation to the changing market conditions. The article emphasizes the need to harmonize PPP practices with contemporary demands of sustainable development and to define a set of criteria that take into account economic, technical, organizational, and social aspects. Five main groups of criteria are proposed, aimed at improving PPP models and assessed through a wide range of indicators, including in line with the policy of the European Union. Expert interviews have been used to determine the relevance of the criteria, allowing for an objective assessment of the importance of each one. The essence of PPP as a tool for strategic management, providing a coordinated interaction between the state and private investors in the construction sector, is provided. The current state and prospects for the development of PPPs in Ukraine are analyzed, taking into account international experience and the specifics of the national market. The defined criteria and sub-criteria for innovative development should form the basis for creating an effective management model that considers all aspects of sustainable development and facilitates the implementation of strategic initiatives. The research results highlight the importance of technical-technological and organizational development as key elements of a successful PPP model. The proposed approaches and recommendations may serve as a foundation for improving the management of construction enterprises, including through the introduction of innovative technologies and management methods.

Keywords: public-private partnership, management tools, construction enterprises, sustainable development, innovative development, evaluation criteria, strategic management, globalization, investments

Introduction

The dynamic interplay between state resources and private enterprise has long been at the core of infrastructure development, particularly in the construction sector. As such, public-private partnerships (PPPs) have evolved as a vital framework to leverage the strengths of both sectors, optimizing efficiency and bridging financial gaps. The PPP model has become increasingly significant for construction enterprises, offering a robust mechanism to tackle large-scale projects amidst economic flux. Given the intricate nature of PPPs, management tools and methodologies tailored to this hybrid structure are essential. They ensure that the partnerships are not only strategically aligned with economic goals but also resilient to the ebb and flow of market demands and societal needs. The current research landscape has thus focused on developing, evaluating, and refining these management tools, considering the global pivot towards inclusive, sustainable growth. Such considerations have become particularly pertinent in light of recent global economic upheavals, including the financial downturns and socio-economic disruptions triggered by health crises and geopolitical tensions. This study delves into the intricacies of the PPP model within the construction industry, exploring the utility and impact of various management tools in fostering robust and resilient economic growth through collaborative enterprise.

Literature review

Previous research has indicated a series of outcomes that must be achieved by PPPs to ensure sustainable development. In their work, Cheng *et al.* (2021) proposed a PPP conceptual framework oriented towards sustainability, with three phases, Brogaard & Petersen (2018) identified eight characteristics of PPPs in development policy, Zhang (2005) investigated the criteria for selecting a private partner in public-private partnerships. In the works of scholars Kosovych (2020), Tsiuman (2023), the importance of public-private partnerships was examined, including the prerequisites for development and substantiation of the significance of PPPs in the mechanism of CSR implementation. However, the toolkit for the activities of construction enterprises based on public-private partnership in Ukraine remains insufficiently studied, and the appropriate criteria necessary for a positive impact are still undefined.

The purpose of the paper is to identify the relevant criteria for evaluating public-private partnerships for the implementation of partnership models in the management of Ukrainian construction enterprises.

Materials and methods

The research foundation includes both local and international scholarly journals, as well as statistical data from the World Bank and the State Statistics Service of Ukraine concerning economic growth indicators for Ukraine and various countries globally. It also incorporates findings from the authors' independent studies. This study employs dialectical techniques and utilizes a mix of general scientific and specialized methods to achieve a cohesive conceptual framework. These methods include the abstract-logical method, generalization, the coefficient method, systemic and structural approaches, along with methods of comparison, grouping, analysis and synthesis, and statistical analysis. Additionally, economic-mathematical modeling and logical generalization have been applied. To specifically address the analysis of public-private partnerships, methods such as stakeholder analysis, cost-benefit analysis, and risk assessment techniques have also been integrated.

Results and discussion

In the course of the research, five groups of criteria: economic-financial, organizational, technical-technological, social criteria, and criteria aimed at harmonization with the national development strategy were identified. To determine the relevance and significance of these criteria, data was collected using the method of interviewing experts from various scientific fields and diverse professional competencies. Regarding the relevant stakeholders (public interest, private interest, and the interest of the broader community), the analysis of the studies provided numerous research results indicating that technical-technological and organizational development are key criteria for a successful partnership model. The research findings can be applied to future management models in Ukrainian construction enterprises based on PPP.

The analysis conducted in the works of Kishchenko *et al.* (2018), Yankovyi *et al.* (2021), Wang *et al.* (2021) demonstrates that the consequences of globalization and liberalization processes on the productivity of construction enterprises have led to radical changes, especially in technical, technological, legal, and economic aspects. Today, nearly 70% of enterprises worldwide operate using models of public-private partnership (PPP). The practice of implementing the PPP model in construction enterprises varies globally depending on the traditional model structure, as well as cultural and historical heritage.

Private sector capital investments are clear indicators of interest for PPP models in construction enterprises and their implementation. The largest number of PPP projects has been implemented through concession agreements (48%) and new investments (40%). Less popular are management models and lease agreements (7%) and the sale of equity stakes (6%). It is evident that market dominance by a few "players" and strong potential market concentration is characterized by an imperfect market form (oligopoly).

Previous research by Kasych & Bondarenko (2022), Hrytsenko *et al*. (2021) indicated a series of outcomes that must be achieved by PPPs to ensure sustainable development. However, these models have not been implemented in the construction sector of Ukraine, although the popularity of PPPs in other sectors has increased over the last decade. Given the above, one of the main objectives is defining appropriate evaluation criteria for PPPs for the implementation of partnership models in the management of Ukrainian construction enterprises. Based on the analysis of existing knowledge and their experience, five possible groups of criteria were identified, and the relevance and importance of selected criteria were tested. The approach to stability of financing through PPPs in construction enterprises is not beneficial. Previous studies have shown that to ensure sustainable development, it is necessary to increase efficiency and technological equipment; obtain additional capital and increase the value of money; introduce private management; improve employee relations; encourage trust and cooperation and enhance private participation; reduce the role of the public sector and the public deficit; ensure risk distribution; facilitate cross-transfers of skills, knowledge, and experience between the public and private sectors, and more. Regardless of their type, PPPs, as a distinctive alternative way of privatization, must promote the following:

1. From the perspective of public interests, PPPs should ensure better performance of the enterprise. At the same time, public authorities (government) possess land and basic infrastructure, assist private partners in making capital investments, facilitate economic regulation, and improve quality and safety systems.
2. From the perspective of private interests, PPPs should provide all the benefits (motives, goals) of private business. The private sector provides the public sector with personnel, operational, commercial, financial, marketing, and managerial support. Thus, PPPs play a particularly important role in the development of infrastructure projects and the provision of quality public services. In the last decade, more complex PPP projects have emerged, especially in terms of transport, education and science, sports facilities, government buildings, health development, and social security.

As noted in the works of Hryhorenko *et al.* (2020), Kruhlov (2021), within the strategic development framework, the key to a successful innovative development program is the best price-quality ratio, which includes: (1) risk distribution; (2) maximum possible gain from efficiency, knowledge, skills, flexibility, and innovations of the private sector; (3) the principle of maintaining the integrity of public service provision and the accessibility of public goods; (4) the principle of transferring expert and professional knowledge from the private to the public partner. The lack of scientific and professional research in the field of PPPs, as well as the absence of possible evaluation criteria, was the main reason that prompted the analysis of potential evaluation criteria for PPPs in construction enterprises using the method of evaluating the preliminary stage of PPP projects, as well as the stages of their implementation, control, and monitoring. The selection of criteria is based on a desk study of relevant documents, scientific and empirical knowledge, and the practice of implementing PPPs. Possible evaluation criteria for PPPs are systematized into five main groups: economic-financial criteria, organizational criteria, technical-technological criteria, social criteria, and criteria for harmonization with EU policy. Each of these criteria is also divided into sub-criteria.

The study has been conducted to determine the criteria and their importance (weight). Experts perform the evaluation of the criteria on a scale from 1 to 10, where 1 is assigned to the criteria considered completely irrelevant, and 10 to those deemed of substantial importance for evaluating Fixed Asset Management in construction enterprises.

The research has been carried out across three groups: basic demographic data, an analysis of the criteria for assessing Fixed Asset Management, and an evaluation of the influence of certain interest groups. It is important to emphasize that a comprehensive analysis of the criteria using the SPSS statistical software is conducted from the perspective of all stakeholders, all groups of criteria, and specific criteria that require prolonged and complex data processing. All groups of criteria and each specific criterion have been analyzed taking into account the interests of the public sector, private sector, broader community, and all stakeholders.

The essence and functions of each criterion group regarding the strategic management of innovative development are detailed in Table 1.

Table 1. Criteria for the Innovative Development of Construction Enterprises

Criterion	Sub-criterion
Economic and Financial Criteria for Innovative Development	Contribution to GDP
	Economic Growth Trends
	Ratio of Government Development Spending to Investment Inflows
	Taxes
	Return on Invested Capital
	Number of Implemented Projects
	Risk Distribution and Management
Organizational Criteria for Innovative Development	Improvement of Management Functions
	Increase in Beneficiary Participation
	Intellectual Capital
	Duration of Partnerships
	Business Process Control
Technical and Technological Criteria for Innovative Development	Improvement of Construction Work Quality
	Modernization of Construction Infrastructure
	Modernization
	Development and Application of Innovative Technologies
Social Criteria for Innovative Development	Environmental Development
	Change in Legal Regulation
	Involvement of Local Authorities
	Reduction of Public Sector Influence
Criteria for Harmonization with European Union Policy on Innovative Development	Protection of Public Interests
	Ensuring of Open Market Access
	Determination of Optimal Subsidy Levels
	Privatization

Source: compiled by the author

The empirical research conducted provides the following insights. The partial results of processing criteria values from various perspectives (all stakeholders, interest groups of the public sector, private sector interest groups, and broad community interest groups) are presented.

In Table 2, the mean values and standard deviations for the criteria across different interest groups according to the research analysis are listed. Due to the sample size, it is challenging to assess statistical differences between subgroups within the sample, but significant deviations from the mean may indicate subgroup attitudes. For instance, the private sector shows little interest in fostering macroeconomic indicators such as GDP growth or long-term budget stability, while evident interest is shown in user participation metrics, ensuring open market access, and improving various technical and technological criteria.

Moreover, all criteria have been filtered through the highest average value, and 15 of them have been selected. The top five priority criteria emerge from the technical and technological group. Generally, the standard deviations in this group are quite small, indicating that all participants are fairly homogeneous in their assessment of the criteria. This suggests that all stakeholders recognize that issues related to technical and technological equipment hinder the development of the construction system.

In the organizational criteria group, four criteria are ranked among the top 15: improvement of management functions, intellectual capital, duration of partnerships, and business process control. This reflects a collective opinion on the potential for enhancing organizational components of Ukrainian construction enterprises. It is proven that these enterprises require capable apolitical managers who can apply global management standards and recognize that human capital is a primary source of competitive advantage and value creation. The duration of partnerships is also recognized as an important criterion, as it facilitates long-term relationships and partnership stability over an extended period according to the terms defined in the main contract.

Among the first 15, there are only two economic-financial criteria: facilitation of capital attraction (beyond the primary state budget) and acceleration of economic growth. Furthermore, among the

European Union policy convergence criteria, only two are noted: protection of public interests and ensuring of open market access, which are crucial in the context of joining the European Union. Two criteria from the social criteria group occupy the last two places; these are ecologically sustainable development and change in legal norms.

Table 2. Results of criteria analysis for evaluating fixed asset management in Ukrainian construction enterprises

Criteria	Public Sector Value Criterion			Value criterion for the private sector		
	Average	Sd	Sdm	Average	Sd	Sdm
Economic and financial criteria						
Simplification of Capital Raising	7,73	1.94	−0,21	6.29	3.82	-1,65
Acceleration of economic growth	7.53	1.85	−0.16	5.57	2.64	−2.12
Invested Return on Capital	7.00	2.27	-0,68	6.71	2.06	−0,97
Lower government spending	7.36	1.65	0,09	6.00	2.31	−1.27
Risk Management Allocation	7.53	1.46	0,34	5.86	1.68	-1,33
Long-term budgetary sustainability	6.64	2.47	-0,38	5.57	1.62	-1,45
Contribution to GDP	6.86	1.66	0,45	4.00	2.58	-2,41
Intermediate group	7.24	1.90	−0.08	5.71	2.39	−1,60
Organizational criteria						
Management Improvements	7.80	1.21	−0.05	7.43	2.30	−0,42
Intellectual capital	7.40	1.99	−0,35	7.43	2.07	-0,32
Duration of partnership	7.67	1.35	0,13	6.71	1.70	−0,83
Control of business processes	7.40	2.53	−0.06	7.71	1.98	0,25
Intermediate group	7.57	1.77	−0.08	7.32	2.01	−0,33
Technical and technological criteria						
Quality Improvement	8.47	1.51	−0.08	8.00	1.79	-0,55
Modernization of equipment	8.07	1.44	-0,45	8.17	1.83	−0,35
Superstructure modernization	8.36	1.22	−0.13	7.67	1.63	−0,82
Development and application of innovative technologies	7.86	1.51	-0,54	8.17	1.83	−0,23
Infrastructure modernization	8.13	1.73	−0.11	8.50	1.76	0,26
Intermediate group	8.18	1.48	−0,26	8.10	1.77	−0,34
Social criteria						
Environmental development	7.20	2.31	−0,18	7.00	2.58	-0,38
Change of legal regulation	7.71	1.64	0,79	6.43	1.99	−0,49
Involvement of local authorities	7.64	1.60	0,70	5.71	2.93	-1,23
Reduction of the influence of the public sector	6.73	1.87	−0,22	5.71	1.80	-1,24
Intermediate group	7.32	1.86	0,27	6.21	2.33	−0,84
Criteria for harmonization with European Union policies						
Protection of public interests	8.20	1.15	0,18	7.86	2.41	−0.16
Ensuring of open access to the market	7.47	2.00	−0,30	6.57	1.72	−1.20
Determination of the optimal level of subsidies	8.00	1.46	0,79	7.43	1.81	0,22
Privatization	7.20	1.61	0,45	5.86	2.12	−0,89
Intermediate group	7.72	1.56	0,28	6.93	2.02	−0,51

Where Sd is the standard deviation; Sdm is the standard deviation between the mean of all stakeholders and the mean of each stakeholder group

Source: calculated by the author

This table exemplifies the diverse priorities and focus areas across different sectors and interest groups within the Ukrainian construction industry, reflecting the multifaceted approach needed to drive sustainable and innovative development.

Greater attention is accorded to criteria related to risk distribution, GDP enhancement, and the acceleration of economic growth, whereas the profitability of investments is not deemed a decisive criterion. A similar situation pertains to social criteria. The public sector demonstrates a heightened interest in certain criteria such as ecological development and the involvement of local authorities.

The broader community harbors significant expectations in the realm of sustainable ecological development. The private sector seeks changes in legislative regulation to facilitate access to PPP projects and the engagement of local authorities.
The public sector exhibits the most significant interest in criteria for harmonization with European Union policies, particularly in the areas of privatization, as part of the overall economic restructuring, and in determining the optimal level of subsidies for specific economic sectors; safeguarding public interests; and ensuring open market access.
An analysis has been conducted to explore the influence of specific groups' interests in the decision-making process of innovative projects. It is established that the power of the stakeholders (public sector, private sector, broad community, and investors) should be balanced – 25% each. This does not apply to the actual decision-making process in management systems, where the power of stakeholder groups is imbalanced. The public sector assumes the most significant role (39%), making decisions regarding the execution of partnerships. The private partner plays an important role in decision-making (25.4%) but must adapt to the requirements of the public sector. The local community has the least influence on decision-making (15.3%).
Criteria defined for partnership models in managing construction enterprises can be used to assess the preparation, implementation, control, and monitoring of partnership projects. Based on scientific and professional developments, expert interviews, and the practices of other countries in implementing partnership relations, five main groups of criteria have been identified: economic-financial, technical-technological, social, organizational, and criteria for compliance with EU policies.

Conclusions. The study demonstrates that financial criteria are not decisive for partnerships in construction enterprises; instead, technical-technological equipment and organizational components that need improvement are considered the main barriers to development. Research findings also indicate a diversity of views among specific interest groups. The private sector does not show great interest in fostering macroeconomic indicators (GDP growth or long-term budget stability), although it is clearly interested in metrics of increased user participation and ensuring of open access to the government. It is crucial to have broad consensus on the scope of PPPs and the process through which PPP projects can be developed, as the benefits provided by PPPs in construction enterprises are linked with all stakeholders.

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Conflict of interest
None.

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УПРАВЛІНСЬКИЙ ІНСТРУМЕНТАРІЙ МОДЕЛІ ДЕРЖАВНО-ПРИВАТНОГО ПАРТНЕРСТВА БУДІВЕЛЬНИХ ПІДПРИЄМСТВ

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Анотація. Стаття досліджує механізми і виклики застосування державно-приватного партнерства (ДПП) у стратегічному управлінні будівельними підприємствами в Україні. Здійснено аналіз впливу глобалізації та лібералізації на ефективність будівельних підприємств і пошуку шляхів оптимізації ДПП для забезпечення їх адаптації до мінливих умов ринку. Акцентується на необхідності гармонізації практик ДПП із сучасними вимогами сталого розвитку та визначення комплексу критеріїв, що враховують економічні, технічні, організаційні та соціальні аспекти. Запропоновано п’ять основних груп критеріїв, які спрямовані на вдосконалення моделей ДПП та оцінюються через широкий спектр індикаторів, зокрема згідно з політикою Європейського Союзу. Для визначення релевантності критеріїв використовувалися інтерв'ю з експертами, що дозволило об'єктивно оцінити важливість кожного з них. Надано сутність ДПП як інструменту стратегічного управління, який забезпечує злагоджену взаємодію між державою та приватними інвесторами в будівельній галузі. Проаналізовано сучасний стан і перспективи розвитку ДПП в Україні, враховуючи міжнародний досвід та специфіку національного ринку. Визначені критерії та підкритерії інноваційного розвитку мають стати основою для формування ефективної моделі управління, яка враховує всі аспекти сталого розвитку і сприяє втіленню стратегічних ініціатив. Результати дослідження підкреслюють важливість техніко-технологічного та організаційного розвитку як ключових елементів успішності моделі ДПП. Запропоновані підходи та рекомендації можуть слугувати підґрунтям для покращення управління будівельними підприємствами, зокрема шляхом впровадження інноваційних технологій та методів управління.

Ключові слова: державно-приватне партнерство, управлінські інструменти, будівельні підприємства, сталий розвиток, інноваційний розвиток, критерії оцінки, стратегічне управління, глобалізація, інвестиції