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# MODELING THE MANAGEMENT OF THE DEVELOPMENT OF PUBLIC-PRIVATE PARTNERSHIP PROJECTS

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**INTRODUCTION.** The paradigm of the concept of public-private partnership is in the process of formation in modern conditions. Historically, the formation of theoretical foundations of public-private partnership began with the generalization of the activities of municipal services, gradually penetrating as its importance for society grew into the sphere of transport services, construction, the social sphere and other industries from the middle of the 19th century, but the beginning of its active use in practice fell only in the 1990s.

**THE HYPOTHESIS OF THE STUDY** is to model the effectiveness of management of the development of public-private partnership projects through the prism of analyzing the public position on the process and result of public-private partnership in various industries.

**THE PURPOSE OF THE STUDY** of the processes of effective

management of the development of public-private partnership projects.

**METHODS:** methods of analysis and synthesis, generalization and scientific abstraction. A comprehensive approach and dialectical principles allowed us to identify the essential characteristics of the studied processes, the forms of their manifestation, to highlight their inherent contradictions and to determine the trends of their development.

**RESULTS.** A hypothesis was put forward and proven about the interdependence of cooperation subjects and public position that arises during the implementation of public-private relations, based on modeling at the stages of implementation of partnership projects.

**KEYWORDS:** public, interaction, public-private partnership, innovations, innovation models, integration, management of innovative development, potential.

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
13	0	0

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## МОДЕЛЮВАННЯ РОЗВИТКОМ ПРОЄКТІВ ПРИВАТНОГО ПАРТНЕРСТВА

УПРАВЛІННЯ  
ДЕРЖАВНО-

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**ВСТУП.** Парадигма концепції державно-приватного партнерства знаходиться у стадії становлення в сучасних умовах. Історично формування теоретичних засад державно приватного партнерства розпочалося з узагальнення діяльності служб міського господарства, поступово проникаючи по мірі зростання значимості для суспільства у сферу транспортних послуг, будівництва, соціальної сфери та інших галузей з середини ХІХ ст, проте початок її активного використання на практиці припав лише на 90-ті роки минулого століття.

**ГІПОТЕЗА ДОСЛІДЖЕННЯ** полягає в моделюванні ефективності управління розвитком проєктів державно приватного партнерства через призму аналізування громадської позиції на процес і результат державно приватного партнерства у різних галузях.

**МЕТА ДОСЛІДЖЕННЯ** процесів ефективного управління

розвитком проєктів державно-приватного партнерства.

**МЕТОДИ:** методи аналізу та синтезу, узагальнення та наукової абстракції. Комплексний підхід і діалектичні принципи дозволили виявити сутнісні характеристики досліджуваних процесів, форми їхнього прояву, виділити властиві їм протиріччя й визначити тенденції їхнього розвитку

**РЕЗУЛЬТАТИ.** Висунуто і доведено гіпотезу про взаємозалежність суб'єктів кооперування та громадської позиції, що виникає під час реалізації державно-приватних відносин, на основі моделювання за етапами виконання партнерських проєктів.

**КЛЮЧОВІ СЛОВА:** громадськість; взаємодія; державно-приватне партнерство; інновації; інноваційні моделі; інтеграція; управління інноваційним розвитком; потенціал.

**Statement of the problem and its relation to important scientific and practical tasks.** The government and the private investor are the two parties directly involved in the implementation of a public-private partnership project. The subsidies and tax benefits provided by the government to the private investor usually depend on the degree of active cooperation of the government, while the level of income and public perception of the private investor often depend on the quality of public services/products provided by the private investor. Moreover, conflicts of interest may arise between the two parties, as the former seeks to maximize social benefits for the general public, and the latter seeks to maximize its profits. Most existing studies have analyzed the mechanism of cooperation in PPPs from the perspective of the two direct participants, i.e. the government and the private investor, the pro-public position is little studied and modeled. This is a complex issue that involves the interaction between the general public and the government, the general public and the private investor, and the government and the private investor.

**The purpose of the study** is a modeling that shows the dynamic equilibrium of joint behavior between the government and the private investor in a PPP, and also takes into account the analysis and participation of the general public as an indirect factor influencing the effectiveness of the final result of cooperation.

**Analysis of recent publications on the problem.** Public-private partnership (hereinafter PPP) is defined as a collaboration between a government (or a public authority) and a private investor for the purpose of project activities, improving service delivery and implementing infrastructure provisions (Hrynova & Butenko, 2013; Hryshchenko, 2011; Hudz & Bairamov, 2016). The government has administrative and political powers. The private investor is responsible for the design, construction, operation and maintenance of the PPP project within the framework of PPP agreements. The government and the private investor are two direct participants who receive corresponding benefits from their collaboration. In addition, as recipients of public services or end-users of infrastructure in PPP projects, the general public is the ultimate beneficiary and makes certain demands on the government and receives public services or products provided by the private investor. Although the general public is an indirect participant in PPP agreements and decision-making, its supervision and evaluation affect the development of PPPs (RDPA, 2017; KMU, 2011; Didych & Naumko, 2023).

Foreign scholars such as A. Atkisson, J. Lescure, W. K. Mitchell, B. Santo, B. Twiss et al. have investigated classical concepts for defining a comprehensive approach to the integration of public-private partnership, but modern scientific research currently lacks integrity and comprehensiveness in the approach to studying current practical issues of forming an innovative model for managing

the development of public-private partnership, taking into account the influence of a changing environment.

**Conclusions and prospects for further research.** Public participation is an activity that the general public, as a third party interested in a PPP project, engages in, as it is allowed to evaluate and analyze the effectiveness of decisions made by the government and the private investor in the implementation of the PPP (Hrynova & Butenko, 2013; Hryshchenko, 2011). In this field, research has been conducted on methods, approaches and mechanisms for evaluating (Didych & Naumko, 2023) public participation in the implementation of PPP projects. Levels of public participation are divided depending on the depth of activity, and accordingly there are differences in the ways of participation of the general public (Dutko, 2020). Modeling the effectiveness of management of the development of public-private partnership projects is an important analytical tool that is widely used in social management (Hudz & Bairamov, 2016), public administration (Dutko, 2020; Maisuradze, 2014; Makukha, 2022), as well as in the areas of business and management (RDPA, 2017). In practice, government and private investor cooperation is difficult to find equilibrium strategies in uncertain conditions due to information asymmetry and dynamic changes in the PPP operating environment.

In general, we note that state financial participation in public-private partnership projects performs a dual function. On the one hand, it is a strategic tool for implementing state policy, which allows determining and supporting priority areas of development – sectoral, regional or social – through the targeted allocation of public resources. On the other hand, state financial participation is a key mechanism for stimulating the private sector to invest in socially significant infrastructure projects. This stimulation is achieved by reducing risks for the private partner, in particular, compensating for uncertainty associated with the macroeconomic situation, and leveling the imperfections of the regulatory and institutional environment (Maisuradze, 2014).

**Conclusions and prospects for further research.** Therefore, the use of innovative digital PPP tools is recommended in the public sphere. This type of toolkit ensures transparency, accountability and efficiency of management based on data, artificial intelligence, digitalization using innovative forms of PPP contracts, implementation mechanisms, etc. These include the following tools:

- digital technologies and PPP management platforms (for example, electronic accounting systems, contract performance monitoring, reporting).

Thus, digital platforms act as a fundamental tool for the development of digital competencies, covering both broad segments of the population and the staff of civil servants.

Thanks to interactive educational environments that offer structured courses and trainings, targeted training of qualified specialists is carried out,

capable of operating with large data sets (Big Data), automation systems and artificial intelligence technologies in the field of PPP. At the same time, Big Data technologies themselves create a synergistic effect, enabling in-depth analysis of management and educational needs, which allows government agencies to formulate policies based on predictive models and current empirical data (KMU, 2011).

Given the course of digitalization within the framework of the European integration vector of the state, it is worth forming a unified digital platform for managing PPP projects, which will ensure the full life cycle of the project: from the initiation and publication of project proposals to conducting competitions, monitoring the implementation of contracts and reporting. It should also include public dashboards for public control. For PPP projects, such a digital platform is a necessary prerequisite for success, as it simultaneously increases the ability of the state partner to effectively manage complex contracts and provides both parties with objective data for monitoring and adapting the project to changing conditions;

- BIM technologies – building and facility information modeling (BIM) throughout the life cycle. At its core, BIM is the process of creating and managing an integrated digital model of an infrastructure facility. The key feature of this model ("digital twin") is the synthesis of spatial (graphic) information with a comprehensive set of semantic data that covers the technical, economic, time and operational parameters of the project. In PPP projects, BIM creates a single information space for synchronized and transparent cooperation of all key stakeholders. The key function of such an environment is to overcome information gaps between different stages of the PPP object's life cycle, ensuring a "seamless" transfer of agreed data from the initial concept and feasibility study to long-term management, modernization and decommissioning (GOV.UK, (2024).

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