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## A MULTIDIMENSIONAL MODEL FOR EVALUATING THE EFFICIENCY OF ONLINE CITIZEN ENGAGEMENT IN PUBLIC GOVERNANCE

**Abstract.** *The article examines theoretical approaches to evaluating online citizen engagement within the system of public governance. Based on a systematic review of academic publications, the fragmentation of existing evaluation models of digital participation is identified. Key groups of indicators characterizing technical, organizational, and societal dimensions of efficiency are determined. It is established that the reduction of transaction costs in digital interaction creates conditions for improving administrative performance and generating public value. A multidimensional conceptual model integrating technological, institutional, and socio-economic parameters of online citizen engagement evaluation is developed. The proposed structure enables digital participation mechanisms to be interpreted as instruments for enhancing the economic and institutional efficiency of the public sector and may serve as a basis for further operationalization of indicators and empirical verification.*

**Keywords:** *online citizen engagement, digital public governance, public sector efficiency, transaction costs, institutional adaptation, public value, e-participation, conceptual model.*

**Introduction.** In recent decades, the digital transformation of public administration has been viewed not only as a technological process for modernizing administrative procedures but also as a tool for improving the economic efficiency of the public sector. The development of e-government and digital citizen participation platforms helps reduce transaction costs, accelerate decision-making, and increase the transparency of public resource allocation [1]. In public sector economic theory, these processes are interpreted as mechanisms for optimizing the institutional environment and increasing

the productivity of public institutions [2].

Citizen engagement in online processes is becoming an important element of the modern digital governance model, as it influences the quality of management decisions and allows for the consideration of public preferences in the formation of public policy. From an institutional economics perspective, citizen participation can be viewed as a mechanism for reducing information asymmetries between the state and society, thereby facilitating a more efficient allocation of resources and the creation of public value [3]. Furthermore, digital feedback channels

help reduce administrative costs for processing requests and improve the responsiveness of government agencies [4].

Despite the rapid development of digital platforms for citizen participation, approaches to assessing their effectiveness remain fragmented. Existing models primarily focus on either the technological parameters of platform operation or the normative-democratic aspects of participation, neglecting a comprehensive assessment of their economic and institutional effectiveness [5]. As a result, an integrative model for assessing online citizen engagement as a factor in improving public administration effectiveness is lacking.

This problem is particularly relevant in the context of the digital transformation of public administration in Kazakhstan, where platform solutions for government-citizen interaction are being actively implemented. However, assessments of their effectiveness remain primarily quantitative and report-based, failing to reflect the institutional and social consequences of digital interaction. This creates a research gap that requires the development of a conceptual model integrating evaluation parameters related to technology, organization, and society.

The aim of this study is to develop a multidimensional conceptual model for assessing citizen engagement in online public administration in terms of economic and institutional effectiveness. To achieve this goal, a systematic literature review is conducted, key assessment indicators are identified, and an integrative framework is developed that integrates the technical, organizational, and social components of digital participation effectiveness.

The development of such a model will expand the toolkit for assessing digital reforms in public administration and create a theoretical basis for further

empirical analysis of the effectiveness of digital platforms for interaction between the state and citizens.

**Materials and methods.** The study's methodological framework is based on systems and institutional approaches to analyzing the digital transformation of the public sector. The study examines online citizen participation as an institutional mechanism for improving public administration effectiveness and reducing transaction costs in government-society interactions.

The study is theoretical and analytical in nature and relies on a systematic literature review using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, which ensures the transparency of selection and reproducibility of results [6]. This approach allowed us to structure existing scientific publications on e-participation and identify consistent groups of evaluation indicators.

The international scientometric platform Scopus was used as a database. The search strategy included a combination of keywords: "digital government," "e-participation," "online citizen engagement," "public sector effectiveness," and "evaluation model."

A systematic review of the literature in the Scopus database revealed 1,163 publications. After deleting 203 duplicate records, 960 sources remained for primary analysis. 820 publications unrelated to the topic of evaluating the effectiveness of online citizen engagement in public administration were excluded from the list of references containing titles and annotations. The full texts of 140 articles were analyzed, of which 105 were excluded due to the lack of operationalized indicators, insufficient methodological transparency, or insufficient attention to institutional effectiveness. The final research corpus included 35 publications that formed the basis of a theoretical

model of a multidimensional conceptual framework (see Fig. 1).

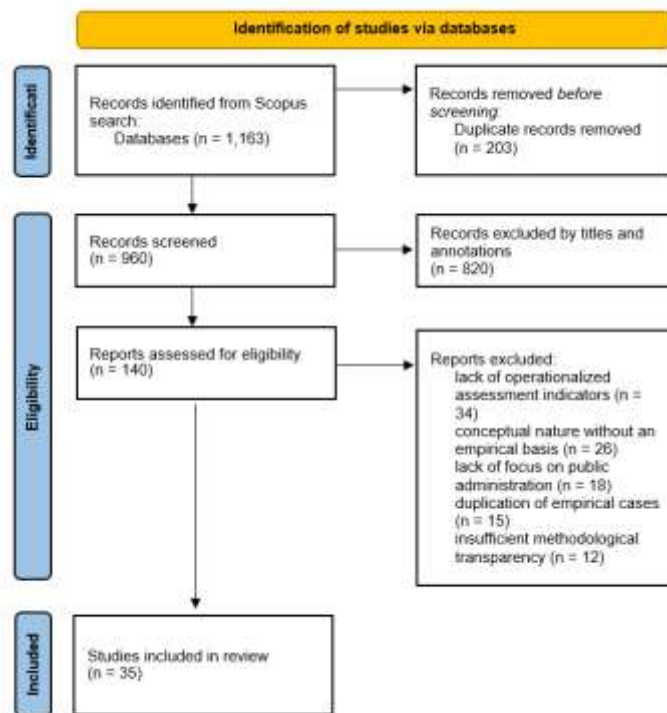


Figure 1. PRISMA flow diagram results

The research corpus includes articles published mainly between 2019 and 2025, reflecting the active phase of digital transformation in public administration during this period. The total volume of the analyzed materials amounted to more than 5,000 pages of scientific text.

The indicators were coded using thematic analysis. At the first stage, open coding was carried out, during which all the above-mentioned indicators of the effectiveness of digital participation were recorded. At the second stage, axial coding was carried out, which allowed the indicators to be grouped into more complete categories. To increase the reliability of interpretation, the coding scheme has been iteratively refined by re-analyzing previously analyzed publications.

The analysis identified three key areas for evaluating the effectiveness of online citizen engagement: technical (characterizing the functioning of digital platforms and reducing transaction

costs), organizational (reflecting institutional responsiveness and management effectiveness) and social (related to the creation of public value and the quality of interaction). These areas were developed using a synthesis of conceptual models, which allowed the integration of disparate approaches into a single conceptual framework.

Thus, the methodological research strategy combines a systematic review of the literature, thematic coding and synthesis of conceptual models, providing a scientific justification for the development of a multidimensional model for assessing online citizen engagement in terms of the economic efficiency of the public sector.

**The research results.** A systematic analysis of 35 scientific publications has revealed patterns in approaches to assessing online citizen participation in public administration. Despite the diversity of terminology and research frameworks, there is a repeatability of certain groups of indicators in the

literature, which indicates the emergence of sustainable approaches to assessment.

At the initial stage of open coding, more than 120 different indicators were identified that are used to measure the effectiveness of digital participation. Further classification made it possible to group them into broad thematic blocks. During the development phase of the axial code, the indicators were combined into three interrelated dimensions reflecting various aspects of the effectiveness of online citizen participation.

The first group of indicators relates to the characteristics of digital platforms and their operational parameters. In peer-reviewed publications, this block includes indicators of accessibility, query processing speed, the level of digital integration, user interface convenience, and the level of process automation [7]. From an economic point of view, these indicators reflect a reduction in transaction costs in the interaction between the state and citizens, optimization of time costs and increased productivity of administrative procedures. A number of studies emphasize that the digitalization of feedback channels helps to reduce the cost of processing requests and increase the scalability of services [8-9].

The second group of indicators concerns the institutional responsiveness of government agencies and their ability to transform digital signals into management decisions. Special attention is paid to such indicators as response time, the proportion of requests processed, transparency of verification procedures, and integration of feedback into the decision-making process [5]. This aspect reflects the effectiveness of management and administrative activities. Within the framework of the institutional economy, this can be interpreted as an indicator of the

adaptability of state institutions and their ability to reduce information asymmetry [2].

The third group of indicators relates to the effectiveness of using digital technologies in a broader socio-economic context. This block includes the level of trust in public institutions, the perception of transparency, and the impact of civic initiatives on changes in legislation and public services [3]. Thus, online interaction is considered as a mechanism for improving the allocation of resources and strengthening feedback between the state and society.

The analysis showed that existing research mainly focuses on one of these aspects, without combining them into a single assessment model. Technological research focuses on the effectiveness of the platform, institutional research focuses on the efficiency of administrative response, and socially oriented research focuses on the level of trust and engagement. This lack of an integrated approach creates a methodological gap that makes it difficult to comprehensively assess the effectiveness of online interaction between citizens. The result of the generalization was the proposal of a multidimensional structure that combines technical, organizational and social aspects into a single conceptual assessment system (see Fig. 2).

The logic of the model is based on the principle of hierarchical relationship between dimensions. The technical dimension is considered as a basic level that provides a functional infrastructure for digital interaction. This reflects the operational efficiency of the platforms, the level of automation, and the reduction of transaction costs when government and citizens interact. Without sufficient technical efficiency, further institutional response is difficult.

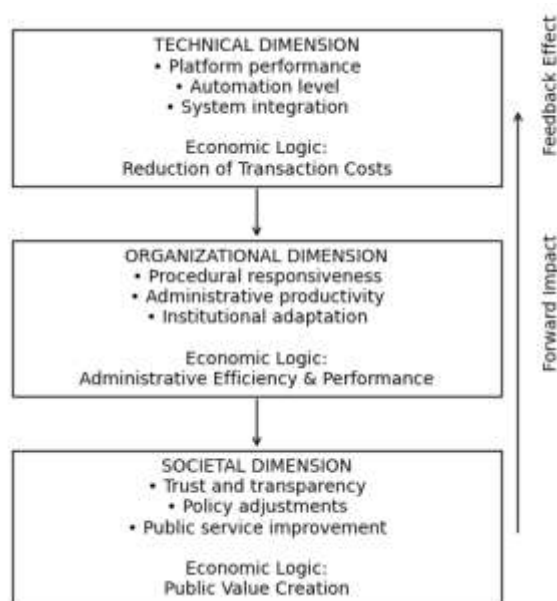


Figure 2. Multidimensional Conceptual Model of Online Citizen Engagement Efficiency

The organizational aspect is formed on the basis of the technical infrastructure and reflects the ability of government agencies to transform digital signals into management decisions. At this level, the effectiveness of procedures, compliance with application deadlines, and the degree of institutional adaptation to incoming initiatives are assessed. Thus, the organizational unit represents an intermediate link between digital infrastructure and social outcomes.

The social aspect is the final level of the model and reflects the socio-economic impact of digital participation platforms. It reflects the development of trust, the perception of transparency and the impact of citizens' initiatives on the adjustment of the regulatory framework and public services. From the point of view of public sector economics, this level is associated with the creation of social value and long-term institutional sustainability [5, 9].

Thus, the proposed model presents online citizen engagement as a multi-level mechanism for improving the economic and institutional effectiveness

of public administration. Its fundamental difference lies in the integration of technological parameters, management processes and social outcomes into a single analytical assessment system.

**Discussion.** The results obtained confirm that the assessment of citizens' involvement in the online environment in the scientific literature is fragmentary and mainly focuses on certain aspects of digital participation. Some studies focus on the technological infrastructure of platforms and their operational effectiveness [1], while others focus on the institutional response of government agencies or the democratic aspects of participation [8]. However, comprehensive integration of technological, organizational, and social assessment parameters is extremely rare.

The model developed in this study expands on existing approaches by combining three dimensions into a single analytical construct. Unlike traditional e-participation models, where effectiveness is often determined by engagement or the number of requests, the proposed system makes it possible to evaluate

online interactions in terms of institutional and economic efficiency.

From the point of view of public sector economics, digital participation mechanisms can be considered as tools to reduce transaction costs and increase resource allocation efficiency [2]. The technical level of the model reflects the infrastructural conditions for optimizing interaction, the organizational level reflects the ability of government agencies to convert digital signals into management decisions, and the social level reflects the long-term consequences of creating public value [9].

Thus, online citizen engagement serves not only as a tool for democratic participation, but also as an economic mechanism for increasing public sector productivity. This shifts the focus of research from the regulatory and political spheres to the assessment of the institutional effectiveness of digital reforms.

**Conclusion.** The digital transformation of public administration highlights the need for a comprehensive assessment of citizens' involvement in the online environment as an element of the institutional and economic effectiveness of the public sector. A systematic analysis of scientific publications revealed the structural fragmentation of existing approaches and the lack of an integrative model combining technological, managerial and social assessment parameters.

In the course of the research, a multidimensional conceptual model was developed that includes technical, organizational, and social aspects of

effectiveness. The proposed structure reflects the consistent logic of creating social effects: from reducing transaction costs and increasing the operational productivity of digital platforms to the institutional adaptation of government institutions and creating public value. Thus, the involvement of citizens in the online environment is interpreted as a systematic mechanism for improving the economic performance of public administration.

The scientific significance of the study lies in the integration of disparate approaches into a single analytical framework that allows assessing the mechanisms of digital participation not only from a regulatory and democratic point of view, but also from the point of view of institutional effectiveness and long-term sustainability of the public sector. The practical significance of the model lies in its applicability for developing indicators for monitoring digital reforms and evaluating the effectiveness of government-citizen interaction platforms.

However, the limitations of the study should be considered. The developed model is conceptual in nature and is based on a qualitative generalization of 35 publications, which implies an interpretative element of the analysis. In addition, the use of a single international database limits the scope of regional research. Therefore, further research should focus on the empirical application of the proposed indicators and quantitative testing of the relationships between the model parameters.

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#### **МЕМЛЕКЕТТІК БАСҚАРУ ЖҮЙЕСІНДЕГІ АЗАМАТТАРДЫҢ ОНЛАЙН-ҚАТЫСУЫНЫҢ ТИІМДІЛІГІН БАҒАЛАУДЫҢ КӨПӨЛШЕМДІ МОДЕЛІ**

**Аңдатпа.** Мақалада мемлекеттік басқару жүйесіндегі азаматтардың онлайн-қатысуын бағалаудың теориялық тәсілдері қарастырылған. Ғылыми жарияланымдарға жүргізілген жүйелі талдау негізінде цифрлық қатысуды бағалаудың қолданыстағы модельдерінің бытыраңқылығы анықталған. Тиімділіктің техникалық, ұйымдастырушылық және қоғамдық өлшемдерін сипаттайтын негізгі индикаторлар топтары айқындалған. Цифрлық өзара әрекеттесу кезіндегі транзакциялық шығындардың төмендеуі әкімшілік нәтижелілікті арттыруға және қоғамдық құндылықты қалыптастыруға жағдай жасайтыны анықталған. Онлайн-қатысуды бағалаудың технологиялық, институционалдық және әлеуметтік-экономикалық параметрлерін біріктіретін көпөлшемді тұжырымдамалық модель әзірленген. Ұсынылған құрылым цифрлық қатысу тетіктерін мемлекеттік сектордың экономикалық және институционалдық тиімділігін арттыру құралы ретінде қарастыруға мүмкіндік береді және көрсеткіштерді әрі қарай операциялизациялау мен эмпирикалық тексеруге негіз бола алады.

**Тірек сөздер:** азаматтардың онлайн-қатысуы, цифрлық мемлекеттік басқару, мемлекеттік сектор тиімділігі, транзакциялық шығындар, институционалдық бейімделу, қоғамдық құндылық, e-participation, тұжырымдамалық модель.

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#### **МНОГОМЕРНАЯ МОДЕЛЬ ОЦЕНКИ ЭФФЕКТИВНОСТИ ОНЛАЙН-ВОВЛЕЧЕННОСТИ ГРАЖДАН В СИСТЕМЕ ПУБЛИЧНОГО УПРАВЛЕНИЯ**

**Аннотация.** В статье рассмотрены теоретические подходы к оценке онлайн-вовлеченности граждан в системе публичного управления. На основе систематического анализа научных публикаций выявлена фрагментарность существующих моделей оценки

цифрового участия. Определены ключевые группы индикаторов, характеризующие техническое, организационное и общественное измерения эффективности. Установлено, что снижение транзакционных издержек цифрового взаимодействия создает условия для повышения административной результативности и формирования общественной ценности. Разработана многомерная концептуальная модель, интегрирующая технологические, институциональные и социально-экономические параметры оценки онлайн-вовлеченности граждан. Предложенная структура позволяет рассматривать цифровые механизмы участия как инструмент повышения экономической и институциональной эффективности публичного сектора и может быть использована для дальнейшей операционализации показателей и эмпирической верификации.

**Ключевые слова:** онлайн-вовлеченность граждан, цифровое государственное управление, эффективность публичного сектора, транзакционные издержки, институциональная адаптация, общественная ценность, e-participation, концептуальная модель.

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