

DIGITAL TOOLS FOR IMPROVING THE EFFICIENCY OF PUBLIC PROCUREMENT OF WORKS IN THE REPUBLIC OF KAZAKHSTAN

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Abstract. *The issue of public procurement effectiveness is becoming increasingly relevant in the context of the observed budget deficit in Kazakhstan.*

In this article, business processes related to ensuring the best combination of low price and quality in public procurement as the main indicators of procurement efficiency are studied and described in more depth. Considering the problems of public procurement efficiency, many researchers analyze the supplier identification stage. However, in the procurement of works, the execution phase is equally, if not more, important for efficiency.

Analysis of the work execution process in Kazakhstan revealed problems related to quality control of the work performed and the construction materials used, as well as limited competition in their procurement. The high degree of the human factor's presence in the quality assurance process and the low availability of information about the demand for goods creates the risk of purchasing poor-quality goods at a high price.

While the effectiveness of using big data in the decision-making process is universally proven, information in the public procurement system is not accumulated properly.

In this regard, to ensure the best combination of price and quality of work, the authors propose a model of public procurement of works using digital tools.

Keywords: *public procurement, procurement efficiency, public administration, digitalization, e-procurement, quality of work, competition*

Reikšminiai žodžiai: *viešieji pirkimai, pirkimų efektyvumas, viešasis administravimas, skaitmeninimas, e. pirkimai, darbų kokybė, konkurencija*

Introduction

Improving the budget policy in terms of increasing the level of effectively spending finances is provided for by the “Kazakhstan – 2050” strategy (Official website of the President of the Republic of Kazakhstan, 2012). The effectiveness of budget spending is largely related to the efficiency of the public procurement system.

The share of public procurement in Kazakhstan’s GDP is 6.6%, which is relatively lower than the average level of this indicator in the countries of the Organization for Economic Cooperation and Development (OECD). At the same time, public procurement accounts for 43% of total government spending, more than the OECD average (OECD 2019). The OECD in its reviews recommends that the Government of the Republic of Kazakhstan build a more efficient public procurement system through:

- ensuring an appropriate level of transparency at each stage of the public procurement cycle;
- providing tender documentation in a clear, detailed, and, if possible, standardized form to ensure access to public procurement for a wide range of people;
- using digital tools for the implementation of integrated e-procurement solutions covering the entire procurement cycle.

An analysis of public procurement from 2019 to 2021 shows that more than half of budget expenditures are directed to the execution of works. In this regard, the authors decided to consider the effectiveness of the process of the public procurement of works through the prism of the above OECD recommendations.

The authors understand efficiency to mean the achievement of target results with the lowest possible costs (financial, time, etc.). However, how effective is the public procurement system and how can it be made more efficient? The authors came to the conclusion that the effectiveness of public procurement is achieved by providing the best combination of price and quality.

Thus, this study aimed to analyze the processes of public procurement of works in terms of:

- the best combination of price and quality;
- a sufficient level of transparency;
- the availability of detailed information of the tender documentation;
- the possibility of using digital tools to improve the efficiency of the public procurement system.

Literature review

According to the legislation of the Republic of Kazakhstan, public procurement is the purchase by customers of goods, works, or services, in whole or in part, at the expense of budgetary funds and (or) their own income.

Public procurement is also defined by the United Nations Development Program (n.d.) as the overall process of acquiring goods, construction works and services, which includes all functions from the definition of needs, selection and attraction of sources, preparation and conclusion of the contract, as well as all stages of contract management until the end of the contract for the provision of service or useful life of an asset.

Cogburn (2003) emphasized that if the procurement function is unable to deliver quality goods and services in a timely manner and at an economical price, then the efficiency of the government obviously suffers.

Basheka and Kabatereine (2013) added that good procurement is that which is free from cor-

ruption and based on well-known procurement practices that promote efficiency and effectiveness as a means to improve service delivery.

Grega et al. (2019) concluded, as a result of their research, that the main problems in the effectiveness of public procurement are excessive bureaucracy, frequent changes in legislation, and corruption.

Komakech (2016) explained in simple terms that public procurement is one of the most appropriate means by which a government can meet the needs of the population in a way that not only provides public goods or services, but also provides value for money to improve their lives and living conditions. Komakech also came to the conclusion that too much emphasis is often placed on adherence to procedures, with less emphasis on performance in order to achieve optimal value for money. It is no longer enough to pretend that you are fully compliant with the law, and yet prices are well above the market rate.

Stritch (2020) argued that procurement is often judged on its performance. Efficiency is related to the ratio of work done in a process and whether that process makes the most of the available resources.

Junusbekova and Khamitov (2021), based on the results of their study, proposed to analyze the processes of concluding and executing contracts between customers and suppliers in order to optimize both delivery time and payment for goods, works, and services.

The authors agree with this. Many scientists, when studying the issue of the effectiveness of public procurement, analyze the stage of determining the supplier. However, in our opinion, the stage of execution of contracts is no less important, especially when purchasing works.

As a result of the literature review for state regulation and optimal decision making in procurement, the authors came to the conclusion that the effectiveness of public procurement is, first of all, a combination of price and quality. Moreover, the level of transparency, bureaucracy, corruption risks, etc., are factors that affect price and quality. To increase the level of transparency, reduce bureaucracy, and minimize corruption risks, it is necessary to use new technologies and digital tools.

Research methods

This analysis was subject to the legal framework governing the process of public procurement of works in Kazakhstan, including the laws and by-laws of the Republic of Kazakhstan.

A literature review of international and Kazakhstani authors was also carried out, and the comparative analysis method identified and substantiated the factors that affect the efficiency of public procurement of works in the Republic of Kazakhstan. In addition, when determining the object and subject of the analysis, the recommendations of the OECD (2022) were considered.

During the study, various methods of general scientific knowledge were used, including methods of economic, statistical and legal analysis.

To obtain the necessary data on public procurement and their processing, logical, comparative research methods were used. As an empirical research base for the analysis of the public procurement system, the authors used the statistical data of the JSC Center for Electronic Finance, which is the state operator of the public procurement portal.

Moreover, the existing digital platforms of the Ministry of Finance, Committee for Construction and Housing, and Communal Services of the Ministry of Industry and Infrastructure Development of the Republic of Kazakhstan were analyzed.

Results

An analysis of public procurement in Kazakhstan for 2019–2021 showed that the largest part of procurement is occupied by works (Figure 1).

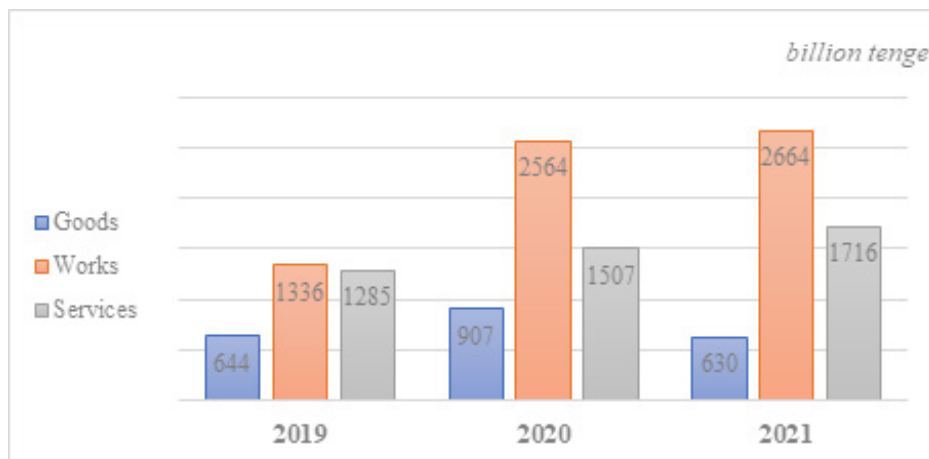


Figure 1. The total amount of public procurement in Kazakhstan by type

It follows from Figure 1 that the procurement volume of goods does not have any stable trend, accounting for only 12.6% of all purchases by the end of 2021. The procurement volume of works in 2020 increased by 92%, and by the end of 2021 it occupied 53% of all procurement purchases. The procurement volume of services also tended to grow but did not reach the indicator of works, occupying 34.4% in 2021.

For this reason, the authors decided to analyze the process of public procurement of works.

The main principles of public procurement in Kazakhstan are:

- optimal and efficient spending of money;
- openness and transparency of the process.

However, the current legislation of Kazakhstan does not fully ensure the implementation of these principles. The process of selecting a supplier is as transparent as possible, but post-contract processes, including the process of accepting the performed work, are still not sufficiently open. Not only the population as a beneficiary, but also the state itself is not able to monitor the procurement of work suppliers as part of the execution of a public procurement contract. This is important for ensuring the required quality of work and fixing average prices for goods.

Low price guarantee

To perform the work, the contractor purchases a certain amount of goods and accordingly forms the demand for these goods. Demand creates its own supply. Moreover, the availability of information on demand will not only form supply, but also ensure a low price due to competition.

Currently, the procurement procedure is as follows (Figure 2).

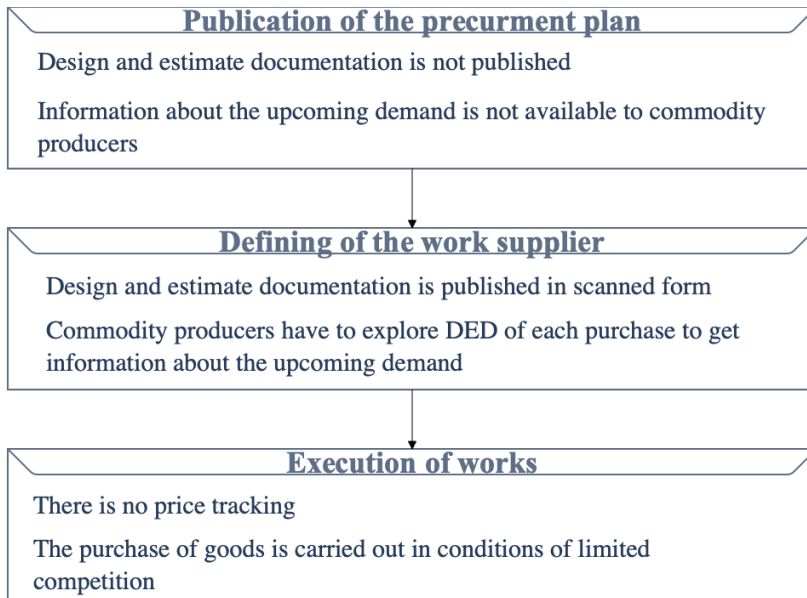


Figure 2. The current process of public procurement of works in Kazakhstan

According to the Law on Public Procurement (2015), the customer approves the public procurement plan and posts it on the public procurement portal (<https://www.goszakup.gov.kz>), which is a mandatory procedure. At this stage, design estimates are not published, so information about upcoming demand is not available to producers.

Further, in order to determine the supplier of works, the customer announces a competition on the portal with the publication of the design and estimate documentation. However, the design and estimate documentation is published in scanned form; therefore, in order to obtain complete information about demand, commodity producers need to study the design and estimate documentation for each purchase of works, which is a laborious process and requires certain time costs.

After the completion of the tender procedures, the contractor proceeds with the work and gradually purchases the goods provided for in the design and estimate documentation. Such a purchase of goods is carried out in conditions of limited competition, since, most likely, a limited number of commodity producers are aware of the presence of this demand (those who are familiar with the design and estimate documentation of this particular work, among many others). There is also a risk of purchasing goods of lower quality than that stipulated by the DED. At the same time, there is no tool for monitoring these purchases by the customer, the public, or other potential contractors.

Thus, the current process of public procurement of works is not sufficiently transparent and effective in terms of ensuring the lowest price.

Quality assurance

A system of standardization is used in public procurement to ensure the quality of the pur-

chased works.

According to the legislation of the Republic of Kazakhstan, a standard is a regulatory document that defines the main set of rules, norms, and requirements for a standardized object. The standard implies the repeated use of these requirements and defines the main product characteristics, application rules, and characteristics of production processes (The Law of the Republic of Kazakhstan “On Standardization,” 2018).

To control the quality of work performed, the customer engages an organization that exercises technical supervision over the execution of work by the contractor. Among other activities, the supervisory organization checks certificates of conformity of purchased goods with standards and laboratory tests of the results of the work performed (obtaining certificates of conformity).

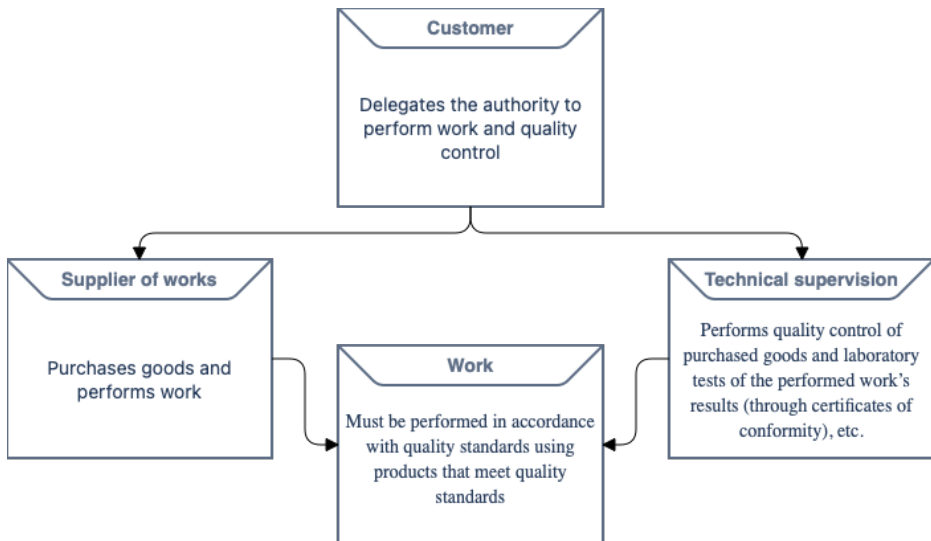


Figure 3. The scheme of ensuring the quality of work performed

Currently, the above activities are carried out manually using paper certificates of conformity. Considering the huge number of them involved when performing a large amount of work, the question arises of the quality of the control itself. In addition, it is possible that forged certificates are used, or they are completely ignored.

Thus, at the end of the work, the customer, having no other quality control mechanisms, is forced to trust the technical supervision specialists and accept the work performed. As a result, many facilities built in Kazakhstan at the expense of the budget (roads, schools, residential buildings, etc.) have low wear resistance and will soon need to be repaired – that is, the budget will have to be allocated again.

Suggested Solutions

The analysis of the public procurement process revealed the following problems:

- the low level of availability of information on the upcoming demand for goods purchased as part of the procurement of works;

- the conditions of limited competition surrounding the purchase of goods to perform work;
- the lack of monitoring of average prices for goods purchased during the performance of works;
- the large amount of labor and time spent on checking certificates confirming the quality of the works performed and the materials used to perform them;
- the lack of the customer's ability to directly control the quality of the work performed and the materials used to perform them.

In order to solve these problems, it is proposed to:

- digitize and increase the availability of estimate data (names of materials, volumes, characteristics, prices) through the use of information platforms;
- increase the transparency of procurement of contractors when performing work to create a competitive environment and monitor prices by introducing a marketplace;
- digitize the results of quality tests of the work performed and materials used and automate the process of their verification.

It should be noted that at present in Kazakhstan there are already various information platforms that will allow the proposed measures to be quickly implemented.

All public procurements are carried out on the public procurement portal, in which the process of determining the supplier of works is automated. At the same time, the process of purchasing materials by the contractor for the performance of work is carried out without the use of any digital tools, and remains closed.

There is a unified portal for aggregating comprehensive non-departmental expertise on construction projects (<https://epsd.kz>, hereinafter referred to as E-DED). E-DED is an electronic platform that provides a partially automated process for submitting and issuing an opinion based on the results of the examination of design estimates, as well as their storage.

To perform work in the field of construction, the E-Qurylys information system (<https://equrylys.kz>) is used. This system provides automation of the activities of all participants in the construction process: the customer, the contractor, inspectors of the state architectural and construction control, as well as experts in architectural and technical supervision. The functionality of E-Qurylys allows one to keep almost all records of work performed in electronic form, from maintaining an electronic journal to compiling and signing acts of hidden, completed work. However, most importantly the system provides the ability to record and track the volume of work performed and the materials used to complete them.

The integration of this system with E-DED would allow for the automatic transfer of estimate data (volumes of planned work, names, volumes, and characteristics of building materials, etc.) to E-Qurylys. However, most of the documentation on this platform is stored in a non-machine-readable form (for example, in PDF format). Thus, before integration, it is necessary to refine the functionality of the E-DED in terms of storing estimate data in a machine-readable form.

On the "Unified Window of the Republic of Kazakhstan for Export-Import Operations" platform of the Ministry of Finance (<https://eokno.gov.kz/public-register/register-ktrm.xhtml>), a register of issued documents on the assessment of compliance with product standards is maintained. At the same time, there is no register of issued certificates of compliance with the standards of the scope of work performed. In this regard, there is a need to create a unified register of electronic certificates of conformity.

These tests are carried out by accredited laboratories, which issue to the applicants (technical supervision for the scope of work; manufacturer for goods) certificates of their compliance with

the standards.

In this regard, it is recommended to develop missing information and improve existing platforms, and then introduce the following model of public procurement of works.

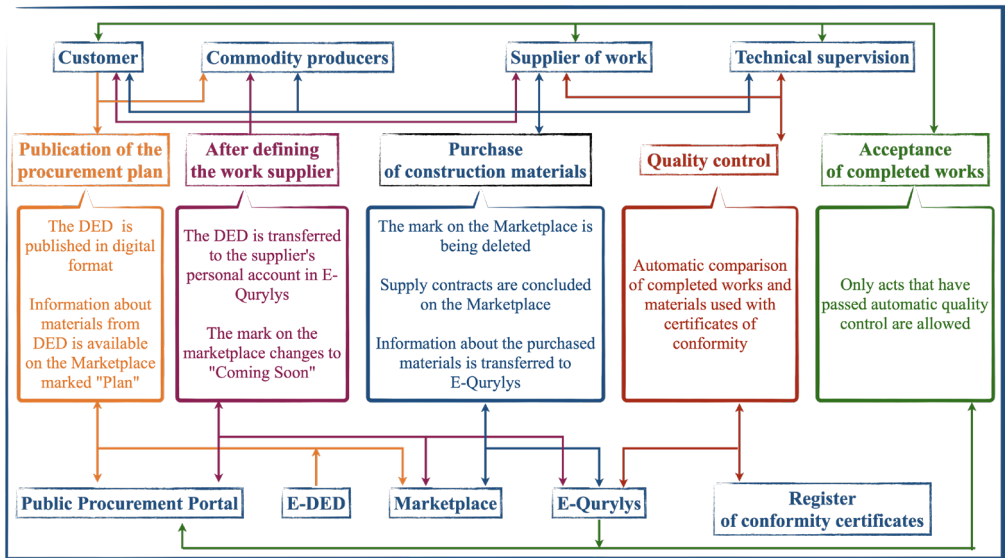


Figure 4. Proposed model of public procurement of works

The scheme of the proposed model is as follows:

1) When the customer publishes a public procurement plan, the estimate data is transferred from the E-DED to the marketplace with the mark "Plan." The marketplace design should allow manufacturers to search for demand for their products with the ability to fine-tune filters (by material characteristics, place of delivery, volume of demand in physical and monetary terms, etc.).

2) After defining the contractor on the public procurement portal, the estimated data are transferred from the E-DED to the E-Qurylys (the contractor's personal account). At the same time, the marking of materials on the marketplace changes to "coming soon." At this stage, the marketplace should allow manufacturers to send offers of their products to the contractor (with specifications, volume, and price).

3) As it is necessary to purchase materials, the contractor, using intuitive manipulations in E-Qurylys, removes the mark from the required product (or part of its volume) on the marketplace. After this, the contractor will be able to choose the best offer of commodity producers and, through a digital signature, conclude an online contract with them on the marketplace platform.

4) As the scope of work is completed, the contractor, by filling out an electronic journal, enters the relevant information indicating the materials used (in the case of purchasing materials on the marketplace, the corresponding fields of the journal are filled in automatically).

5) As the journal fills up, E-Qurylys automatically pulls data from the certificate register and compares them with the amount of work performed and materials used to confirm compliance

with national standards. At the same time, the actual use of the purchased materials must be confirmed by digital signatures of technical supervision specialists.

6) In the absence of conflicts at the previous stage, E-Qurylys, at the request of the contractor, generates an electronic certificate of completion (the amount is indicated according to the design and estimate documentation).

7) Acts of completed work generated by E-Qurylys are sent to the public procurement portal for signing by the customer.

The interaction of public procurement participants with information systems can be seen in the following figure.

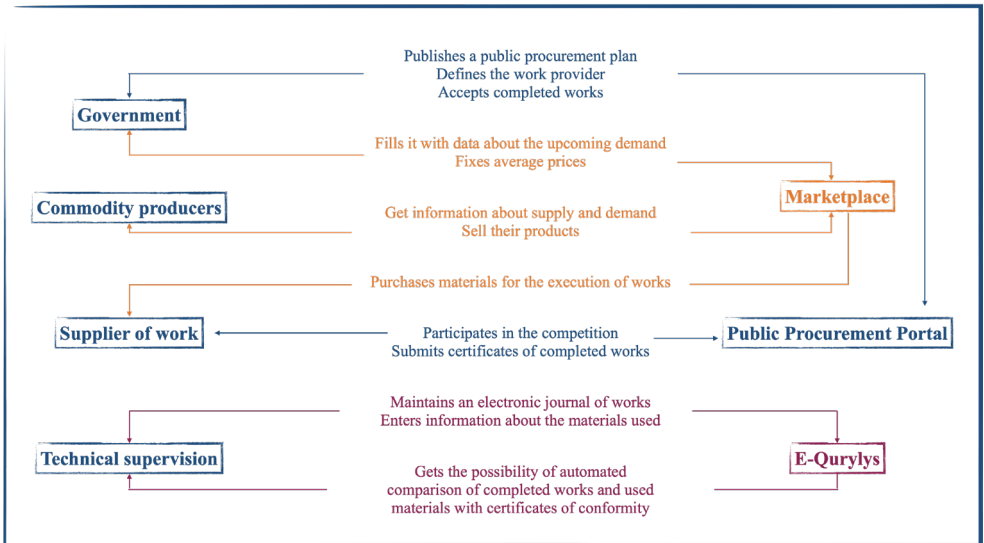


Figure 5. The interaction of public procurement participants with information systems

It should be noted that this scheme provides for automated filling of the marketplace and verification of work performed only within the framework of the design and estimate documentation. Works within the framework of design and estimate documentation, as a rule, are expensive. Therefore, such control over them is justified.

However, public procurement is also carried out for works in the form of current and medium repairs, which do not provide for design and estimate documentation. This means that information about the materials necessary to perform these types of work will not be available in the E-DED.

E-Qurylys provides for the possibility of maintaining an electronic journal without design and estimate documentation by entering the necessary data manually. For example, JSC KazAvto-Zhol already uses this system in the implementation of the average repair of highways of national importance.

In this regard, contractors performing medium and current repairs can also use E-Qurylys. At the same time, the generated information about the necessary materials must also be trans-

ferred to the marketplace, and the materials purchased must later be compared with the register of certificates. Thus, the proposed model will provide the best combination of price and quality of the purchased works.

The total volume of demand for goods created by public procurement will be formed both throughout the country and in the context of regions. The tool for monitoring the purchase of goods by contractors for the performance of work will allow the public and other potential contractors to be involved in quality control of the purchased goods. The marketplace will simplify the search for a buyer for existing producers and will facilitate the creation of new industries.

The presence on the portal of the exhibited act of completed work will mean the presence of a check of the compliance of the purchased goods and the scope of work with national standards. This will increase the responsibility of testing laboratories and organizations exercising technical supervision, which are representatives of the customer at the site of the work being performed.

Discussions and conclusions

Today, in the conditions of the state budget deficit of the Republic of Kazakhstan, the issue of ensuring the efficiency of the public procurement system is becoming more and more urgent. Considering that it represents the largest share of public procurement, it seems a priority to assess the procedure for procurement of works.

Thus, the procedure and mechanisms for ensuring the best combination of price and quality of work performed were subject to analysis. Quality control of both work and materials used is necessary to ensure the durability of the objects under construction, increase their service life, and reduce the cost of their repair. Moreover, competition in the purchase of building materials will lead to a decrease in their price, which will be used for design in the future.

The results of our research allow us to draw certain conclusions.

It was established that it is possible to increase competition in the purchase of building materials by ensuring the maximum availability of information to producers on the demand created by public procurement of works. The implementation of a marketplace was proposed, as if there is a design estimate it automatically collects all estimated information and publishes them to collect offers. At the same time, the availability of this information at the procurement planning stage will allow producers to prepare the appropriate stocks of their products. For the purchase of building materials for works that do not include design estimates, it is also possible to use the Marketplace by manually posting demand.

Furthermore, the analysis revealed problems in the work of technical supervision, creating a risk of reducing the quality of quality control, as well as the possibility of committing a corruption offense. Currently, verification of the conformity of the certificates of goods used and the work having been performed to national standards is carried out manually by a technical supervision specialist. Considering the human factor, there is the threat of a lack of completeness, a lack of reconciliation of certificates, or even collusion with the work contractor and the signing of acts of work performed without conducting appropriate quality tests. In this regard, the authors proposed a digital mechanism that allows for automatic verification of certificates of conformity, thereby eliminating the human factor.

3. In general, according to the authors, the introduction of the proposed model of public procurement of works will increase their efficiency through:

- ensuring the availability of information on the upcoming demand for goods purchased as part of the procurement of works;

- increasing competition in the purchasing of goods for the performance of work;
- obtaining reliable data on average prices for goods and their use in the design;
- reducing technical supervision costs for verification of certificates confirming the quality of work performed and materials used for their implementation;
- providing the customer with the possibility of direct quality control of the work performed and the materials used for their implementation;
- increasing the demand and responsibility of accredited laboratories that test the quality of work and building materials.

Digital transformation of public procurement is an excellent opportunity for the economy and has vast potential if fully exploited. Promoting competition, strengthening the economy and economic growth might be just a click away (Pekoji et al. 2019).

References

1. Basheka, Benon C., and D. Kabatereine. 2013. "Public Procurement Reforms in Uganda. A Historical Trajectory." *Journal of Public Procurement and Contract Management* 2 (1): 27–41.
2. Coggburn, Jerrell D. 2003. "Exploring Differences in American States Procurement Practices." *Journal of Procurement Management* 3 (1): 3–28.
3. Grega, Matus, Marta Orviska, Juraj Nemeč, and Colin Lawson. 2019. "Factors Determining the Efficiency of Slovak Public Procurement." *The NISPAce Journal of Public Administration and Policy* 12 (1): 43–68. <https://doi.org/10.2478/nispa-2019-0002>.
4. Junusbekova, Gulsara, and Zhaslan Khamitov. 2021. "Anti-corruption monitoring in the public procurement management system in the republic of Kazakhstan." *Public Policy and Administration* 20 (4): 410–424.
5. Komakech, Robert A. 2016. "Public Procurement in Developing Countries: Objectives, Principles and Required Professional Skills." *Public Policy and Administration Research* 6 (8): 20–29.
6. OECD. 2019. *Public Procurement in Kazakhstan: Reforming the system in order to increase efficiency*. <https://doi.org/10.1787/c11183ae-en>.
7. OECD. 2022. "Recommendation of the Council on Public Procurement." OECD Legal Instruments. <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0411>.
8. Official website of the President of the Republic of Kazakhstan. 2012. "Address by the President of the Republic of Kazakhstan, Leader of the Nation, N.Nazarbayev "Strategy Kazakhstan – 2050": new political course of the established state." State of the nation address. https://www.akorda.kz/en/addresses/addresses_of_president/address-by-the-president-of-the-republic-of-kazakhstan-leader-of-the-nation-nnazarbayev-strategy-kazakhstan-2050-new-political-course-of-the-established-state.
9. Pekoji, Nina, Katja Hodošček, Lara Valjavec, and Petra Ferk. 2019. "Digital Transformation of Public Procurement as an Opportunity for the Economy." *LeXonomica* 11 (1): 15–42. <https://journals.um.si/index.php/lexonomica/article/view/134>.
10. Stritch, Justin M., Stuart Bretschneider, Nicole Darnall, Lily Hsueh, and Yifan Chen. 2020. "Sustainability Policy Objectives, Centralized Decision Making, and Efficiency in Public Procurement Processes in U.S. Local Governments." *Sustainability* 12 (17): 6934. <https://doi.org/10.3390/su12176934>.
11. The Law of the Republic of Kazakhstan "On Public Procurement," No. 434-V ZRK. December 4, 2015. <https://adilet.zan.kz/rus/docs/Z1500000434>.

12. The Law of the Republic of Kazakhstan "On Standardization," No. 183-VI ZRK. October 5, 2018. <https://adilet.zan.kz/rus/docs/Z1800000183>.
13. United Nations Development Program. N.d. "Procurement." Lao PDR. <https://www.undp.org/laopdr/procurement>.

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SKAITMENINĖS PRIEMONĖS VIEŠŲJŲ PIRKIMŲ EFEKTYVUMUI GERINTI KAZACHSTANO RESPUBLIKOJE

Anotacija. *Viešųjų pirkimų efektyvumo klausimas tampa vis aktualesnis stebimo Kazachstano biudžeto deficito kontekste.*

Šiame darbe išsamiau nagrinėjami ir aprašomi verslo procesai, susiję su geriausio mažos kainos ir kokybės derinio užtikrinimu viešuosiuose pirkimuose. Šie procesai vertinti kaip pagrindiniai pirkimų efektyvumo rodikliai. Atsižvelgdami į viešųjų pirkimų efektyvumo problemas, daug tyrėjų analizuoja tiekėjų identifikavimo etapą. Tačiau darbų pirkimuose efektyvumui ne mažiau ar net svarbesnis yra jų vykdymo etapas.

Atlikus Kazachstano darbo proceso analizę paaiškėjo problemos, susijusios su atliekamų darbų ir naudojamų statybinių medžiagų kokybės kontrole bei ribota konkurencija jų pirkimuose. Reikšmingas žmogiškasis faktorius kokybės užtikrinimo procese ir mažas informacijos apie prekių paklausą prieinamumas kelia suponuoja prielaidas, kad už didelę kainą gali būti nupirtos nekokybiškos prekės.

Nors didžiųjų duomenų naudojimo sprendimų priėmimo procese efektyvumas yra visuotinai įrodytas, informacija viešųjų pirkimų sistemoje net nėra tinkamai kaupiama.

Atsižvelgdami į tai, siekdami užtikrinti geriausią darbų kainos ir kokybės derinį, autoriai straipsnyje siūlo darbų viešųjų pirkimų skaitmeninėmis priemonėmis modelį.

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