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## THE DIGITAL E-VOTING SYSTEM IN KAZAKHSTAN: A FOUR BOTTOM LINE ANALYSIS

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*Electronic digital voting technology delivers a major modernization to public systems that drives electoral changes while enhancing democratic governance methods. As a nation that aims to innovate its electoral system the Central Asian country Kazakhstan utilizes electronic voting throughout its electoral processes. Electronic voting within Kazakhstan encountered multiple issues for implementation before its termination as an electoral practice. This article analyzes Kazakhstan's experience in e-voting by using “The Four Bottom Lines Framework” (productivity, quality of service, results, and democracy) to provide a comprehensive understanding of its successes, failures, and implications for future electoral reforms.*

**Key words:** Electronic voting, democratic governance, Kazakhstan elections, digital transformation, electoral reform

### Introduction

“The term e-voting is used hereby to denote a voting process, which enables voters to cast a secure and secret ballot over a network” (Gritzalis, 2002). Kazakhstan implemented electronic voting through parliamentary elections in 2004 to achieve modernization of its electoral system. “Voting is a method by which groups of people make decisions” (Paatey, 2011). E-voting served the government as both a technological advancement marker and a method to enhance election efficiency and transparency. The system was discontinued by 2011 because political factors merged with social aspects along with technical difficulties. The issue of the introduction of digital elections in Kazakhstan is becoming an important aspect of the modernization of democratic processes. This step would improve the efficiency and transparency of the electoral system, because it will automate the collection and processing of votes, which reduces the counting time and reduces the likelihood of errors (Nakai, 2018).

### ***Productivity: Efficient Use of Resources***

The productivity dimension of e-voting centers on resource efficiency together with cost-effective outcomes. Voting systems should be clear and understandable to the extent that both voters and candidates can easily embrace the outcomes (Kohno et al., 2004). Through electronic voting systems organizations can lower expenses that come from conventional voting through decreased printing costs and reduced staffing

requirements and manual vote tabulation expenses. The Central Election Commission of Kazakhstan established the pilot e-voting projects in 2021 and 2023 specifically to evaluate their cost-effectiveness and scalability potential (CEC Kazakhstan, 2023). As information technology advances, countries globally are substituting outdated punch cards and mechanical voting systems with electronic voting systems (e-voting) to enhance voter engagement and expedite the announcement of election results (Shat, 2025). The elimination of physical ballots alongside reduced human resource need enables e-voting to optimize electoral processes while cutting operational expenses. Creating and implementing e-voting systems demands a considerable financial outlay at the beginning. Secure software and hardware expenses along with cybersecurity measures and maintenance costs form the basis of e-voting implementation costs. The people of Kazakhstan did not trust the government to protect e-voting system integrity which made the system unprofitable for the country's economy. Public trust in the system determines the financial benefits of e-voting technology because insufficient voter engagement can counteract the cost reduction potential.

#### ***Service Experience: Accessibility and User-Friendliness***

The service experience dimension of e-voting requires public services to be accessible and user-friendly to meet citizen requirements. E-voting creates opportunities for better electoral accessibility by providing improved services to marginalized groups who include people with disabilities as well as elderly citizens and residents of remote areas. The 2023 pilot project enabled electronic voting in select regions which led to a reported minor growth in voter participation according to Kazinform (2023). The results point to e-voting solutions as a means to improve voting convenience and expand accessibility which might enhance public interest in civil participation. The digital inequality obstructs full access to electronic voting systems. The population of Kazakhstan experiences significant gaps between different social classes regarding their technology ownership and digital competency levels. The infrastructure required for e-voting systems together with reliable internet access proves insufficient in many rural parts of the country. Some population segments who experience marginalization risk losing their voting rights because of the current setup. Kassen (2020) states that unbalanced access to technology combined with unequal levels of digital literacy contributes to advanced social inequalities which limits the democratic scope of e-voting. The government needs to establish digital infrastructure together with education programs which will help reduce digital inequalities. The implementation of awareness programs and training sessions will boost digital literacy skills throughout the public so that everyone possesses the capabilities needed for e-voting participation. The absence of such social initiatives would result in e-voting becoming a tool for maintaining current inequalities and preventing disadvantaged individuals from voting.

#### ***Results: Long-Term Societal Impact***

The results dimension of e-voting centers on tracking lasting societal developments which include greater voter turnout as well as greater electoral clarity and better public faith in democratic organizations. The system of e-voting makes progress toward these benefits through automated election administration alongside reduced possibilities of fraud. Blockchain technology deployed within e-voting systems creates an unalterable vote database which makes elections more transparent and less manipulatable according to Kazakhstan Blockchain Forum (2022). Blockchain operates as a distributed system which creates tamper-proof transaction records that multiple computers can access securely and transparently (Germann&Serdült, 2017). The use of blockchain technology enhances inclusivity through its development of voting systems that reach more voters. Blockchain technology enables secure remote voting through its decentralized online platform which provides voters with a tamper-resistant system to submit ballots. Kazakhstan has achieved inconsistent outcomes using electronic voting systems. The system demonstrates promising opportunities to enhance electoral transparency as well as operational efficiency but its deployment faces challenges stemming from digital system flaws together with operational implementation issues. E-voting system security faced criticism from stakeholders because they feared both hacking attacks and unauthorized data alterations. These fears worsened because of the inadequate cybersecurity measures put in place. E-voting in Kazakhstan has had minimal long-term effects on society because the system did not reach its intended goals.

### ***Democracy: Transparency and Accountability***

The democratic aspect of electronic voting depends on innovation to build transparent systems along with models that develop accountability and earn vote-holder trust in electoral processes. Electronic voting (e-voting) represents a significant evolution of people's democratic practices, driven by technical progress and requesting efficiency and accessibility but also challenging accountability (Gritzalis, 2002) . E-voting allows democratic governance to improve through creating elections that are transparent together with heightened accountability. E-voting systems become more secure along with transparent due to encryption and blockchain technologies that minimize election fraud risk and manipulation (CEC Kazakhstan, 2023). The political interference with e-voting initiatives in Kazakhstan has reduced its capability to advance democratic practices. Kassen (2020) explains that the deep distrust toward governmental institutions combined with election process politicization led to the rejection of e-voting. The public trust in e-voting systems has declined due to fears about system management control and insufficient independent oversight. Kazakhstan could potentially overcome the challenges associated with e-voting and pave the way for more secure and transparent electoral practices in the future (Kassen, 2020). The government needs to establish transparency together with accountability and public involvement throughout the e-voting system design and implementation process. An essential component for public

trust development includes strengthened regulatory frameworks together with civil society organization monitoring of e-voting processes.

### Conclusion

Kazakhstan's experience with e-voting offers valuable lessons for other transitional societies considering similar reforms. The Four Bottom Lines Framework provides a comprehensive lens for analyzing the productivity, service experience, results, and democracy dimensions of e-voting. Kazakhstan needs to invest in strong digital infrastructure and improve cybersecurity and transparent accountable governance systems to establish e-voting as a reliable electoral reform tool. The e-voting experience of Kazakhstan has exposed crucial problems which need resolution to achieve future success. Kazakhstan needs to implement complete solutions which unite technical aspects with social components and governance structures to build a secure and efficient e-voting framework. A secure e-voting system requires two key measures: the deployment of advanced encryption protocols and ongoing assessments for system vulnerabilities. The government needs to dedicate funding to improve digital infrastructure for rural areas as well as underdeveloped regions to eliminate current digital gaps. The implementation of extensive education programs about digital literacy will help citizens develop confidence when using e-voting platforms. A system of transparent regulations together with independent oversight bodies serves to maintain accountability and restore public trust. Kazakhstan's foundation for a democratic e-voting system that provides dependable electoral processes will emerge through addressing these fundamental priorities.

### References

1. Central Election Commission of Kazakhstan (CEC Kazakhstan). (2023). Report on the pilot e-voting project. Retrieved from <https://www.election.kz>
2. Germann, M., & Serdült, U. (2017). Internet voting and turnout: Evidence from Switzerland. *Electoral Studies*, 47, 1–12. <https://doi.org/10.1016/j.electstud.2017.03.001>
3. Gritzalis, D. (2002). Principles and requirements for a secure e-voting system. *Computers & Security*, 21(6), 539–556. [https://doi.org/10.1016/S0167-4048\(02\)01014-3](https://doi.org/10.1016/S0167-4048(02)01014-3)
4. Kassen, M. (2020). Politicization of e-voting rejection: Reflections from Kazakhstan. *Transforming Government*, 14(2), 305–330. <https://doi.org/10.1108/tg-11-2019-0106>
5. Kazakhstan Blockchain Forum. (2022). Blockchain technology for e-voting: Opportunities and challenges. Retrieved from <https://www.blockchainkz.kz>
6. Kazinform. (2023). Kazakhstan tests e-voting in local elections. Retrieved from <https://www.inform.kz>

7. Kohno, T., Stubblefield, A., Rubin, A. D., & Wallach, D. S. (2004). An analysis of an electronic voting system. McGraw Hill. <https://doi.org/10.1109/secpri.2004.1301313> <https://avirubin.com/vote.pdf>
8. Nakai, R. (2018). Party politics and fortuity behind the I-voting introduction in Estonia. The Annals of Japanese Political Science Association, 69(2), 2\_127–2\_151. [https://doi.org/10.7218/nenpouseijigaku.69.2\\_127](https://doi.org/10.7218/nenpouseijigaku.69.2_127)
9. Paatey, E. (2011). The design of an electronic voting system. Research Journal of Information Technology, 3(2), 91–98. <http://www.maxwellsci.com/print/rjit/v3-91-98.pdf>
10. Shat, M. Z. M. (2025). Public perception of voting systems: Evaluating trust in traditional vs. e-voting. International Journal for Research in Applied Science and Engineering Technology, 13(I), 299–305. <https://doi.org/10.22214/ijraset.2025.66256>

## **ҚАЗАҚСТАНДАҒЫ ЭЛЕКТРОНДЫҚ ДАУЫС БЕРУ ЖҮЙЕСІ: ТӨРТ НЕГІЗГІ КӨРСЕТКІШ БОЙЫНША ТАЛДАУ**

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Электрондық цифрлық дауыс беру технологиясы қоғамдық жүйелерді модернизациялауда маңызды қадам болып табылады, ол сайлау өзгерістерін ынталандырып, демократиялық басқару әдістерін жетілдіреді. Өзінің сайлау жүйесін жаңғыртуды мақсат еткен Орталық Азиядағы мемлекет – Қазақстан барлық сайлау процестерінде электрондық дауыс беруді пайдаланады. Қазақстанда электрондық дауыс беру енгізілгеннен кейін бірнеше қиындықтармен бетпе-бет келіп, сайлау практикасы ретінде тоқтатылды. Бұл мақалада Қазақстанның электрондық дауыс беру тәжірибесі «Төрт негізгі көрсеткіш» моделін (өнімділік, қызмет көрсету сапасы, нәтижелер және демократия) қолдана отырып талданады, бұл оның жетістіктері мен сәтсіздіктерін және болашақ сайлау реформаларына әсерін кешенді түрде түсінуге мүмкіндік береді.

**Кілт сөздер:** электрондық дауыс беру, демократиялық басқару, Қазақстандағы сайлаулар, цифрлық трансформация, сайлау реформасы

## **ЦИФРОВАЯ СИСТЕМА ЭЛЕКТРОННОГО ГОЛОСОВАНИЯ В КАЗАХСТАНЕ: АНАЛИЗ ПО ЧЕТЫРЁМ КЛЮЧЕВЫМ ПАРАМЕТРАМ**

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*Технология электронного цифрового голосования представляет собой значительную модернизацию общественных систем, стимулирующую изменения в избирательном процессе, одновременно улучшая методы демократического управления. Казахстан, как страна, стремящаяся к инновациям в своей избирательной системе, использует электронное голосование во всех избирательных процессах. Электронное голосование в Казахстане столкнулось с множеством проблем при внедрении, прежде чем было прекращено как избирательная практика. В данной статье анализируется опыт Казахстана в области электронного голосования с использованием модели "Четыре ключевых параметра" (продуктивность, качество обслуживания, результаты и демократия), что позволяет всесторонне оценить его успехи, неудачи и последствия для будущих реформ в избирательной системе.*

**Ключевые слова:** электронное голосование, демократическое управление, выборы в Казахстане, цифровая трансформация, избирательная реформа