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ELECTRONIC VOTING – WAYS TO IMPLEMENTATION OF THE ELECTRONIC MECHANISMS OF DIRECT DEMOCRACY IN UKRAINE

Abstract. The article is devoted to the research of the concept, forms of electronic voting and approaches to its organization in the countries of Europe, Asia and the USA. The normative regulation of this sphere is shown in European and domestic legislation. The formation of the national e-governance system is shown. It is analyzed that the main purpose of electronical voting technologies is the person's exercise of his will, as well as the process of counting votes, without mediating interference, which may affect the result (maliciously or under the influence of the human factor).

It is grounded that the electronic voting system has already been introduced in many countries around the world: the USA, Canada, Brazil, India, Belgium, Australia, Estonia, and South Korea. In the UK, Germany, France, Spain, Portugal, Italy, Norway, Switzerland, Russia, Kazakhstan, Japan, and China experiments are being carried out on its use. However, it is proved that the most interesting and one of the most successful is the experience of Estonia, the basis of the system of electronic voting which is the use of the Internet, and also a special identification card (ID-card), which certifies the identity of the voter, is considered fair.

It is noted that the introduction of the electronic voting mechanism contains potential risks and disadvantages of use, including: vulnerability of computer systems (viruses, hacking attacks, etc.); distrust of a large part of the population to the technology of electronic voting; the possibility of manipulation and third-party interference in the will of the will; the lack of opportunity to obtain evidence of an offense in the event of suspicion of falsification and, accordingly, to effectively challenge the offense; significant cost of technology at the implementation stage; unavailability of the Internet for a large part of the population; the lack or low level of computer literacy of certain categories of citizens; an increase in the "digital divide" of society. It is proved that the expansion of the sphere of application of various forms of electronic voting, which are already actively implemented in Ukraine, contribute to a more complete involvement of the public in public-public dialogue and the political process, first and foremost, among young people — the most receptive to technological innovations and, at the same time, not the most skeptical about the usual democratic institutes of a public group.

Keywords: elections, electronic democracy, electronic voting, types of procedures for electronic voting, Internet voting, technical means of electronic voting.

ЕЛЕКТРОННЕ ГОЛОСУВАННЯ – ШЛЯХ ДО ВПРОВАДЖЕННЯ ЕЛЕКТРОННИХ МЕХАНІЗМІВ ПРЯМОЇ ДЕМОКРАТІЇ В УКРАЇНІ

Анотація. Стаття присвячена дослідженню поняття форм електронного голосування та підходів до його організації у країнах Європи, Азії та США. Показано нормативне регулювання цієї сфери в європейському та вітчизняному законодавствах. Висвітлено становлення національної системи електронного врядування. Проаналізовано, що основним призначенням електронних технологій голосування є здійснення людиною свого волевиявлення, а також здійснення процесу підрахунку голосів, без втручання посередників, що можуть вплинути на результат (зловмисно, або під впливом людського фактора).

Обґрунтовано думку про те, що електронна система голосування вже запроваджена у багатьох країнах світу: США, Канаді, Бразилії, Індії, Бельгії, Австралії, Естонії, південній Кореї. У Великобританії, Німеччині, Франції, Іспанії, Португалії, Італії, Норвегії, Швейцарії, Росії, Казахстані, Японії, Китаї проводяться експерименти з її використання. Однак обґрунтовано, що найцікавішим та одним з найбільш успішних справедливо вважається досвід

Естонії, в основі системи електронного голосування якої лежить використання мережі Інтернет, а також спеціальної ідентифікаційної картки (ID-картки), яка посвідчує особу виборця.

Відзначено, що впровадження механізму електронного голосування містить потенційні ризики та недоліки використання, серед яких: вразливість комп'ютерних систем (віруси, хакерські атаки тощо); недовіра значної частини населення до технології електронного голосування; можливість маніпуляцій та стороннього втручання у результати волевиявлення; відсутність можливості отримати докази про правопорушення у випадку підозри у фальсифікації та, відповідно, ефективно оскаржити правопорушення; значна затратність технології на етапі впровадження; недоступність Інтернету для значної частини населення; відсутність чи низький рівень комп'ютерної грамотності певних категорій громадян; збільшення "цифрового розриву" суспільства. Доведено, що розширення сфери застосування різних форм електронного голосування, які вже активно впроваджуються в Україні, сприяти повнішому залученню населення до державно-громадського діалогу та політичного процесу насамперед молоді — найбільш сприйнятливої до технологічних інновацій і, водночас, чи не найбільш скептично налаштованої щодо звичних демократичних інститутів.

Ключові слова: вибори, електронна демократія, електронне голосування, види процедур електронного голосування, інтернет-голосування, технічні засоби електронного голосування.

ЭЛЕКТРОННОЕ ГОЛОСОВАНИЕ – ПУТЬ К ВНЕДРЕНИЮ ЭЛЕКТРОННЫХ МЕХАНИЗМОВ ПРЯМОЙ ДЕМОКРАТИИ В УКРАИНЕ

Аннотация. Статья посвящена исследованию понятия форм электронного голосования и подходов к его организации в странах Европы, Азии и США. Показано нормативное регулирование этой сферы в европейском и отечественном законодательстве. Освещено становление национальной системы электронного управления. Проанализировано, что основным назначением электронных технологий голосования является осуществление человеком своего волеизъявления, а также осуществление процесса подсчета голосов, без вмешательства посредников, которые могут повлиять на результат (злонамеренно, или под влиянием человеческого фактора).

Обосновано мнение о том, что электронная система голосования уже внедрена во многих странах мира: США, Канаде, Бразилии, Индии, Бельгии, Австралии, Эстонии, Южной Корее. В Великобритании, Германии, Франции, Испании, Португалии, Италии, Норвегии, Швейцарии, России, Казахстане, Японии, Китае проводятся эксперименты по ее использованию. Однако обоснованно, что самым интересным и одним из самых успешных справедливо считается опыт Эстонии, в основе системы электронного голосования которой лежит использование сети Интернет, а также специальной идентификационной карточки (ID-карты), которая удостоверяет личность избирателя.

Отмечено, что внедрение механизма электронного голосования содержит потенциальные риски и недостатки использования, среди которых: уязвимость компьютерных систем (вирусы, хакерские атаки и т. п.); недоверие значительной части населения к технологии электронного голосования; возможность манипуляций и постороннего вмешательства в результаты волеизъявления; отсутствие возможности получить доказательства правонарушения в случае подозрения в фальсификации и, соответственно, эффективно обжаловать правонарушения; значительная затратность технологии на этапе внедрения; недоступность Интернета для значительной части населения; отсутствие или низкий уровень компьютерной грамотности определенных категорий граждан; увеличение "цифрового разрыва" общества. Доказано, что расширение сферы применения различных форм электронного голосования, которые уже активно внедряются в Украине, способствовать более полному вовлечению населения в государственно-общественный диалог и политический процесс, в первую очередь молодежи — наиболее восприимчивой к технологическим инновациям и одновременно едва ли не самой скептически настроенной относительно привычных демократических институтов.

Ключевые слова: выборы, электронная демократия, электронное голосование, виды процедур электронного голосования, интернет-голосование, технические средства электронного голосования.

Formulation of the problem. The right of the people as a carrier of sovereignty and the sole source of power in Ukraine to directly exercise power is guaranteed by the Constitution (Article 5, Part 2). To ensure the realization of this inalienable right, first of all, various forms and mechanisms of direct (straight) democracy are called. Ukrainian legislation provides for such forms of direct democracy as elections, referendum, public hearings, people's initiative, general citizens' meeting and other forms of people's will, public opinion, etc. that are not prohibited by law, that are characterized by voting, discussion and holding of meetings. Ensuring the constitutional rights of the citizens and the development of democracy depends on the qualitative preparation and holding of elections and referendums [1]. The current voting system is costly, unprotected from administrative pressure and unauthorized interference. Numerous facts of falsification of voting results undermine the trust of citizens in representative bodies and generate political apathy.

In today's information society the use of so-called "electronic democracy" has become widespread. Electronic democracy is characterized by widespread use of information and communication technologies for the implementation of democratic procedures and the involvement of the public in the process of shaping the public policy. The importance of studying the phenomenon of electronic voting is due to the fact that its introduction will expand the

possibility of involving citizens in decision making of national importance, minimizing the influence of the human factor on the counting of votes and contributing to the formation of the civil society in Ukraine.

Analysis of the recent research and publications. The issue of implementing electronic voting tools and approaches to its organization in other countries was the subject of scientific research by such domestic and foreign authors as I. H. Sidenko, M. S. Mikhrovska, N. V. Hrytsiak, S. H. Solovyov, M. N. Grachyov, O. Yu. Pyeskova, I. Yu. Polovko, S. V. Fateyeva, A. A. Nasybulin, M. Yu. Mostova, N. V. Tytovska, D. A. Kravets, D. V. Uhryumov, V. N. Khalyzyev, K. Yu. Matrenina, S. A. Ovchynnikov. In the domestic science the international experience of electronic voting has not been studied enough.

The purpose of the article is to analyze various forms of electronic voting in foreign countries in view of the prospect of implementation in Ukraine.

Presenting the main material. Electronic voting (e-voting) is a comprehensive term that combines several different types of voting, covering both the process of electronically voting and the process of automatically counting votes using electronic devices and special software. Electronic voting is one of the tools of electronic democracy. Ukrainian legislation defines electronic voting as a vote on any public issue, including participation in polls, elections, referendums, involving the use of electronic means for the identification and counting of the votes [2].

The primary purpose of the electronic voting technology is to exercise the will of the person, as well as the process of counting votes without the intervention of intermediaries, which may affect the result (maliciously or under the influence of the human factor).

Under electronic voting technologies it is understood: punch cards and optical scanning systems for ballots, special "voting kiosks" (including autonomous direct voting systems, for example, used by deputies during voting in the Verkhovna Rada). Also, electronic technologies can be used to transmit ballots and votes using phones, isolated computer networks or the Internet [3].

Types of electronic voting procedures:

Remote voting using Passport ID and the Internet. Voting process: the voter connects his ID card to the card reader, goes to the CEC website, logs in with the PIN code and gets to the electronic bulletin, votes and confirms with the pin his/her choice. The voter's vote has already been processed, counted and made public online.

Physical voting at the polling stations with the counting using electronic urn. This voting process is similar to the traditional, but each bulletin is thrown away not in simple plastic urns, but in a digital urn that is connected to the Internet and after reading the bulletin, the system automatically recognizes the vote and counts the results.

Voting using special digital terminals. Special digital terminals are computers with touch screens, such as those that replenish your mobile account. Such terminals can be multifunctional with the possibility of authorization through the Passport ID-card or by - using an ordinary passport through the

provision of a special number for voting from members of the commission [4].

The most common material and technical means.

1. ***Vote-recording Technologies*** — the filled in ballot is placed in the electoral machine that registers the result of the expression displayed on the ballot paper or other card and automatically calculates the results of voting.

2. ***Punched Card*** is used together with voting machines that leave the hole in the punch card, which is the process of voting, after which the voter drops the punch card to the election urn.

3. ***Optical Scan Marksense*** provides for the electoral machine to read information by optical means.

4. ***Direct-recording Electronic Voting System – DRE*** — this is a voting by recording a voice using an electronic display equipped with mechanical or opto-electronic components that can be activated by the voter; while the voter's choice is processed using a computer program [5].

It is worth noting that in the world there are a variety of electronic voting systems that are constantly being tested, modified, supplemented and developed. The world's first mechanized voting equipment was patented in the United States in 1892. For centuries the United States has been practically the only supplier of voting equipment throughout the market. Systems used in the United States included lever equipment, perforation equipment, direct electronic voting (DRE) and optical reading equipment (OMR). Electronic voting complexes are widely used in local and federal elections in the United States. In 2002 the federal law "Help America Vote Act" was passed in order to escape from paper ballots, lever devices (voters twist a lever next to the candidate's name) and punched card machines (along with the names of candidates on special cards punches open). Already in 2004 29 % of registered voters used direct-recording electronic (DRE) machines.

Today in the US, in most polling stations, electronic voting machines equipped with a punch tape were replaced by touch-screen system. The voter should only click the screen a few times making his choice. This new technology cost four billion dollars and was introduced at polling stations in 42 states of 50. On the part of US polling stations there are also former voting systems: regular ballot papers that need to be ticked, old punch cards in which holes need to be pierced, and optical machines. In some states you can vote by mail (this is the most popular method in Oregon) and even on the Internet. However, voting by mail in different states is regulated differently. In some states ballots of the absent voters are accepted only until election day, in others — after too [6].

The most common form of e-voting in RF is the use of optical scanning complexes for election ballots, that is electronic ballot boxes. The recent example of the introduction of electronic urns is the election of the President of the RF in 2018 where polling stations were equipped with complexes for processing election ballots with a total of 10000 units. Such complexes consist of accumulated for bulletins and receiver devices located on the lid of the election box, which combines all electronic hardware the basis of which is a micro-

processor with a scanner connected to it. For storage of the complex is provided with a permanent storage device, there is also the ability to connect an SD memory card. The use of such complexes minimizes possible falsifications of the results at the vote counting stage, but they are not protected from the so-called putting of counterfeit ballots [7]. Among the CIS countries the most massive electronic technologies in the field of elections were applied at the elections of the head of state in the Kyrgyz Republic in 2017. For the first time electronic information and election systems (IES) were used, which included automatic read-out boxes (ARB), special protected data transmission channels, software, central server and website. With them there were equipped 374 polling stations throughout Kyrgyzstan [8].

Electronic voting system has already been introduced in many countries around the world: the USA, Canada, Brazil, India, Belgium, Australia, Estonia, South Korea. In the UK, Germany, France, Spain, Portugal, Italy, Norway, Switzerland, Russia, Kazakhstan, Japan, and China experiments are being carried out on its use.

However, the most interesting and one of the most successful is fairly the experience of Estonia, the basis of the system of electronic voting is the use of the Internet, as well as a special identity card (ID-card) that identifies the identity of the voter. In Estonia the procedure for electronic voting was enshrined in several normative legal acts: the Law "On Elections to Parliament" of June 12, 2002, the Law "On Elections to the European Parliament" of December 18, 2002, the Law "On Elections to Local Self-Government" of March 27, 2002, the Law "On Referendum" of March 12, 2002. Since 2005 an electronic voting without any exceptions is held in all the elections. In 2005 9317 voters voted online, and in 2015 elections to the Parliament of Estonia via the Internet were given 176 329 votes, which is 30,5 % of the total. In the 2019 elections to the Parliament of Estonia 247 232 votes, 43,8 % of the total, were submitted through the Internet.

How does the Internet voting in Estonia go? The physical presence of a person in the polling station is not required. Any Estonian can vote through the Internet being anywhere in the world and at any time of the day.

Through the computer the voter must use an ID card (ID-card) with a built-in chip that identifies the person with the document along with the passport. You also need to have a device that reads for such a card and download a special program from the site of the electoral. After this the voter goes to the electoral site, places his card on the reader and votes for his candidate.

The electronic voting is open one week before the election date. Moreover, at this time, the voter can vote as many times as possible. He can vote for the same candidate every other time or change his preferences all the time. But at 00 o'clock in the day preceding the official election date the electronic voting closes. As a result only the last option chosen by the voter is taken into account. And if a person comes to the poll and votes with the help of a regular ballot, then his electronic voice is reset and is counted only the physically given one.

In addition, electronic voting is possible through special terminals with touch screens in the polling stations. This option requires the voter turnout at the polling station, but he knocks off the problem of falsifications on the ground — the voter's vote immediately enters the electronic database that is stored on the server of the election commission [9].

The absence of serious violations and wide support for online voting by Estonian citizens make it possible to judge its sufficient reliability, security and legitimacy of the results obtained with its help. However, one should not forget that Estonia is a small state, with an active electoral right in which there are just over 1 million citizens. Therefore, there is no major burden on the remote electronic voting system unlike states where the number of voters is tens of times higher and in which the system may give rise to failures with greater probability [9].

The use of reliable and objective means of voting and the protection of their results has been the subject of repeated discussions at the international and European levels, as set out in particular in a number of reports of European Commission for Democracy through Law — Venice Commission devoted to issues of correspondence of remote voting (mail voting or electronic voting) to the Council of Europe standards.

In a report approved on March 12–13, 2004, the Venice Commission warned of the need to take additional measures to minimize the risk of fraud and identified 5 principles that reflect the foundations of European democracy and are equally suitable for both election campaigns and referendums:

1. Universal right to vote: all the people have the right to vote.
2. Levels of voting rights: each voter has an equal number of votes.
3. Freedom of vote.
4. Secrecy of the right to vote.
5. Direct right to vote.

In view of this, the Venice Commission recommended the following: electronic voting can only be used provided that:

• the system is safe/secure and reliable;

• the electronic voting system should be transparent, i.e.

• provide an opportunity to verify its functioning;

• the voters should have the opportunity to receive confirmation of their choice and

• fix it in case of error;

• in order to facilitate the recalculation of the votes in the event of a conflict situation, a procedure for the printing of votes may be envisaged [10].

The Committee of Ministers of the Council of Europe, recognizing that in recent years the use of information and communication technologies by member states has increased significantly during the elections, on June 14, 2017, adopted new Recommendations on the rules of electronic voting. The new Recommendations are considered to have lapsed the former Recommendations (2004) to eleven member states on the legal, organizational and technical standards for electronic voting in 2004, as well as the new regulation of the organization and conduct of electoral voting in the elections in the member states of the Council of Europe. This document

defines the following electronic voting objectives: enabling the voters to cast votes from places other than polling stations in their constituencies; facilitating the voter's vote; facilitating participation in elections and referendums of the citizens who have the right to vote and live or are abroad; expanding access to the voting process for the voters with limited personal attendance at the polling station and the use of equipment available there; increasing the turnout by providing additional voting methods; the relevance of voting and the level of development of society and the increase in the use of new technologies as a means of communication and participation of the citizens in democratic processes; decrease with time the total expenses of the bodies conducting elections or referendums; reliable and quick notification of the results of the elections [11].

In Ukraine, at the state level, a number of measures have been taken to establish a national electronic governance system. In accordance with the Concept for the development of electronic democracy in Ukraine, approved by the Cabinet of Ministers of Ukraine from November 8, 2017, the period between 2017 and 2018 is intended to form the basis for the introduction of electronic voting, as well as electronic electoral process, electronic referendums and electronic plebiscites, and direct implementation this system should take place by 2020. [2] At the same time, the absence in Ukraine of a methodology for assessing the development in the field of electronic democracy does not allow to objectively assess the processes associated with the mentioned issues.

For our country the introduction of the electronic voting system is not limited to the level of discussions. Thus, an attempt to fix the e-voting at the legislative level (albeit at the level of the concept) was fixed in 2011, when the bill № 8656 "On the concept "Implementation of the Electronic Voting System" was registered in the Verkhovna Rada.

The author of the legislative initiative, the People's Deputy of Ukraine O. I. Tyshchenko, drew attention to the fact that "the traditional electoral system in Ukraine is too costly and requires the participation of a large number of people in the preparation, organization of the elections and the formation of incoming information at the stage of counting votes, which leads to spending significant funds from the state budget of Ukraine, the possibility of distorting incoming information for counting votes and considerable time expenditures". Therefore, the document was proposed to lay the foundation for the introduction of the latest information technology in the electoral process. However, the bill was later revoked and discontinued.

It is worth noting another experience of Ukraine on this issue, that, although it can not be considered a complete attempt to introduce e-elections, however, may well simplify and bring about such a transition in the future. In this context, you can highlight:

• the introduction of biometric passports of the citizens of Ukraine, as well as internal passports in the form of ID-cards that in the future can be used to identify the voter during the electronic voting;

• now the citizens of Ukraine have the opportunity to receive an electronic digital signature that may also be needed when introducing e-voting;

• today, on the eve of the presidential and parliamentary elections, the Ukrainians are able to check their presence on the electoral rolls online — through a special service on the website of the State Register of Voters, which is already a significant step forward towards electronization of the electoral process;

• not a less achievement in this context can be considered the transition of the CEC to procurement through the electronic system PROZORRO of gradual electronization of the activities of the CEC [12].

Studying the world experience of implementation shows that attention should also be paid to the potential risks and disadvantages of the use of the electronic voting mechanism: the vulnerability of computer systems (viruses, hacker attacks, etc.); distrust of a large part of the population to the technology of electronic voting; the possibility of manipulation and third-party interference in the results of the exercise of will; the lack of opportunity to obtain evidence of an offense in the event of suspicion of falsification and, accordingly, to effectively challenge the offense; significant cost of technology at the implementation stage; unavailability of the Internet for a large part of the population; the lack or low level of computer literacy of certain categories of citizens; an increase in the "digital divide" of the society. One of the main reasons is the inability to provide information security in the face of the continuing threat of cyber-intervention by Russia. According to Freedom House, Russia only in 2017 intervened in elections in 28 countries of the world.

Conclusions. The development of voting technologies, especially in recent years, has become massive in global practice, and the experience gained now allows us to talk about establishing common standards and requirements for the modernization of the electoral process. Electronic voting represents a new, in terms of efficiency, field of the electoral process and in this regard is of great urgency. This is due, firstly, to the fact that electronic voting is not only a new form of recording the will of the electorate, but also a qualitative leap forward in the development of democracy in general. However, this quality is not in the creation of new forms of democracy, but in fundamentally new, technologically, functioning of democratic institutions.

World experience shows that in order to implement and effectively use electronic voting, a long and coordinated work of the state, political and public organizations, and the expert community to overcome the technical and legal problems that arise when implementing the above-described system will be required. Taking into account the above-mentioned shortcomings and risks of the electronic voting procedure, as well as the lack of experience, its use requires a cautious and well-considered position regarding the use of Internet technologies during the exercise of the will. At the same time, in an era of intensive development of information space and information society, it is impossible to stand aside the technological progress. However, the condition for the use of electronic vo-

ting mechanisms in Ukraine should be guarantees of the safety of its implementation. In addition, electronic voting should be used as a parallel form of traditional expression of will, and not as a single, non-alternative mechanism of electing the power.

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