

Requirements for applying electronic voting in Algeria

متطلبات تطبيق التصويت الإلكتروني في الجزائر

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The date of Submission: 2024-03-12

The date of acceptance: 2024-05-25

Abstract:

In recent years, the world has witnessed growing interest in electronic voting as an alternative to traditional voting. This is due to several factors, including technological developments and digital transformation, and the desire of many countries, including Algeria, to improve the electoral process in terms of transparency, integrity and efficiency. This study seeks to capture the requirements and feasibility of applying electronic voting in elections in Algeria by addressing the concept of electronic voting, evaluating it and its various systems. It also examines the opportunities for its reflection in Algeria through mechanisms of reflection on the ground and builds on States' successful experiences in this area.

Keywords: technological development; Digital democracy; Electronic elections; Electronic voting; Traditional voting; Integrity of the electoral process.

الملخص

لقد شهد العالم في السنوات الأخيرة تزايد الاهتمام بالتصويت الإلكتروني كبديل عن التصويت التقليدي، ويرجع ذلك إلى عدة عوامل، منها التطورات التكنولوجية والتحول الرقمي، ورغبة العديد من الدول منها الجزائر في تحسين العملية الانتخابية من حيث الشفافية والنزاهة والكفاءة. حيث تسعى هذه الدراسة إلى الاضطلاع بمتطلبات وإمكانية تطبيق التصويت الإلكتروني في الانتخابات في الجزائر من خلال التطرق لمفهوم التصويت الإلكتروني وتقييمه وأنظمتها المختلفة، كما تبحث فرص تجسيده في الجزائر من خلال آليات التجسيد على أرض الواقع؛ والاستفادة من تجارب الدول الناجحة في هذا المجال.

الكلمات المفتاحية: التطور التكنولوجي؛ الديمقراطية الرقمية؛ الانتخابات الإلكترونية؛ التصويت الإلكتروني؛ التصويت التقليدي؛ نزاهة العملية الانتخابية.

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Introduction:

In recent years, elections have undergone a major digital transformation, with many States relying on electronic means to hold elections. This shift is due to many factors, including accelerated technological developments, and many States' desire to improve the electoral process in terms of integrity, transparency and efficiency. e-elections have become an option and a new mechanism for reflecting digital democracy, whose practice depends on electronic rather than traditional means.

Although digital democracy is one of the basic ideas of traditional democracy, the political system in which the people themselves are governed comes from the people's will. But they also seek to adapt to modern technological shifts, which make it possible for people to participate in politics more easily and effectively.

Digital democracy provides a variety of new mechanisms for political participation, such as electronic voting, which is one of the most prominent mechanisms of digital democracy. It allows voters to vote online without having to go to polling stations.

Until recently, voting had been dependent on traditional means, but with the rapid technological development of all spheres of life, there was an urgent need to shift to modern technological means in the exercise of that right, making it easier for citizens to fulfil their right from anywhere and at any time.

Electronic voting has thus become an urgent issue facing states' electoral administrations, which would facilitate the electoral process at all stages and represent a new pattern of voting, reflecting on the nature of the electoral system, the electoral process itself, and even democracy as an idea, practice and instrument.

Algeria, like other nations of the world, is moving towards the adoption of an electronic voting system in the electoral process in order to adapt the electoral system to modern developments and methods brought about by the information revolution under the so-called "By electronic management". However, this application is not done at once but in stages and after many requirements, whether legal, human, technical or other, that ensure the correct and holistic application of electronic voting, which contributes to the promotion of democracy, increased political participation, quality of the electoral process, and the achievement of more practices supportive of integrity and transparency. Consequently, the subject of electronic voting has received increasing attention in Algeria, where numerous studies and research have been carried out on its applicability. Algeria has also worked to provide the requirements for the application of electronic voting in order to achieve in the future the holding of Algeria's first electronic elections.

In order to elaborate on the subject of electronic voting in Algeria, we will try in this study to answer the following question: what are the requirements for applying electronic voting in Algeria as an alternative to traditional voting?

To answer this question, it was necessary to divide the study into two axes; In the first axis, we addressed the concept of electronic voting by defining it: its importance and its different patterns. Only the second axis examined the possibility of applying electronic voting in Algeria by presenting the most important requirements of applying it.

In order to respond to this problem and take note of the topic of the study, we have basically relied on the analytical descriptive approach by presenting and analysing information and explaining them to achieve results. We have also secondary reliance on the comparative approach by presenting some international models that have succeeded in applying electronic voting and comparing it with Algeria that seeks to apply electronic voting in order to benefit from these international experiences.

1. What is electronic voting:

Elections are one of the most important pillars of democracy, the mechanism by which people's representatives are selected and their will expressed. In recent years, the electoral process has witnessed significant technological developments, with electronic elections becoming an option in many States. Electronic elections have many advantages that make them a modern tool for improving the electoral process, and electronic voting is an important step in strengthening democracy, allowing citizens to exercise their right to vote regardless of material or geographical circumstances, through the use of information and communications technology. Through this axis we will try to address what electronic voting is by defining it; Its importance is by analysing the most important advantages and disadvantages of this system and, finally, by addressing the most important voting patterns.

1.1- Definition of electronic voting:

Technological and technical developments in various fields have changed many concepts and terminology with a view to modernizing public administration, which reflects the renewal of something and making it more modern and appropriate to modern technologies⁽¹⁾. Among these concepts is the concept of democracy, where so-called digital democracy has become practised by many means and mechanisms, most notably electronic voting. And despite the novelty of this term, it was known by many writers and scholars as well as on Eid from legal organizations; Therefore, some definitions of jurisprudence and law will be presented in this study as follows:

1.1.1-Definition of jurisprudence:

One of the most important definitions of electronic voting is the following:

It is "to proceed with the political right to elections and to choose candidates through the use of information technology instead of traditional methods ballot papers and boxes and hence to store results in its computer systems according to certain security and technical standards to achieve maximum transparency, accuracy and security ensuring the integrity of the electoral process electronically"⁽²⁾.

It is also defined as "the use of electronic techniques in the voting process in an environment subject to supervision, electronic screening and tabulation of results in part or in whole by electronic means"⁽³⁾.

¹ - Dictionary of French, Larousse, present edition, France, 2008, p 73. (Modernize: vt rejuvenate, make more modern, better adapted to the techniques presented.)

² - Omar Abdul Hafiz Ahmed Omar; Electronic voting as a guarantee of the integrity of the electoral process "a comparative study with reference to the situations of Egypt and Jordan"; Journal of the Jordanian University of Zaytouna for Legal Studies, vol. 2, No. 1 (2021); p 171.

³ - Belgamel Ali, Mazwagi Nabila; Electronic voting: concept and challenges; Journal of Legal and Social Sciences; Volume 8. Issue 3; p. 398; September 2023; Zayan Ashour Al-Jalafa University, Algeria

In another definition, "all electronic means that can be used to cast votes and tabulate votes, including all electronic means and systems that are used to complete the electoral process"⁽¹⁾.

The Network Knowledge Electric "ACEB defined it as:" The use of electronic means of voting in elections and public referendums. "

Through the introduction of jurisprudence definitions, it is clear that they share the type of means used in electronic voting that are modern technological means that allow the transition from traditional voting to electronic voting.

1.1.2- Legal definition:

Despite Algeria's trend of applying electronic voting and attempting to provide for its application requirements, there are no legal texts defining electronic voting. Unlike some other countries, including the United States of America, a detailed definition of electronic voting has been established in American law. "Help America Vote", 2002, approved to address voting problems that emerged in the 2000 presidential elections.

The law's definition of electronic voting includes:

- Identification of ballot papers; In addition, the law's definition of electronic voting also includes associated documents and practices, which include identifying the components of the device and the versions of these components; Testing the system during its manufacture; Maintenance; Record-keeping from system errors and defects; Identify special system changes.

The drafting of the American Electronic Voting Act aims to ensure the integrity and accuracy of the voting process and to protect voters' rights.⁽²⁾

By previous definitions, electronic voting can be defined as an electoral system based on the use of electronic devices as an alternative to the use of classical papers and means for election voting. This is in order to increase transparency, integrity and efficiency in the electoral process and increase the electoral turnout.

1.2- The importance of electronic voting:

The importance of electronic voting is demonstrated by the fact that it is part of the schemes of States' transition from traditional to e-governance, which ensures a shortening of time, effort and money, as well as many advantages that reflect the importance of electronic voting, the most important of which will be described below:

* Increased political participation:

Electronic voting is a voting system that provides easy access to voters, regardless of how well polling stations are designed and distributed. Voters can easily vote from home by logging into a website, selecting a few candidates and clicking the "Vote" button⁽³⁾.

Electronic voting also provides access to voting for all citizens, including those with special needs and illiterate citizens. Electronic voting devices are compatible with the needs

¹ -Haj Khidar Abbas and Soha Zaki Nur; Electronic voting system in parliamentary elections (Iraqi experience); The Journal of Investigator Al-Halli for Legal and Political Sciences Issue IV/7th p. 453.

² - Mohammed Misbah Mohammed Al-Naji Muhammad; The legal system for electronic elections is a comparative study; The House of Thought and Law for Publication and Distribution; 2018 edition; p. 216; Mansoura; Egypt

³ -Lamia Tala; Syber is a democracy and the development of political participation; Electronic voting is a model; Leading Journal of Political Studies; Vol. 3; Issue 01; Faculty of Information and Communication; p46; University. Algeria 3 † .Algeria; 2021.

of persons with disabilities and provide means for the voter to access the candidate's image and data⁽¹⁾.

Electronic voting is also an effective way to promote the political participation of residents abroad, ensuring that their voice is heard in the democratic process. They are allowed to vote from anywhere in the world. This is important because they are citizens with the right to political participation in their country, even if they live abroad. In particular, electronic voting promotes the political participation of overseas residents by providing more comfortable and easy options. Instead of having to travel to embassy or consulate headquarters, overseas residents can vote from their homes, workplaces or any other place where they have internet access. This is a particularly important feature for overseas residents living in remote areas or having difficulty travelling⁽²⁾.

Enhancing transparency and integrity: Electronic voting can help enhance transparency and integrity in the electoral process by providing accurate and complete records of votes cast. Electronic voting can also help reduce election fraud, as electronic voting technology can contribute to the elimination of election fraud. Through electronic voting, the voter's identity can be verified securely and reliably, using imaging technology and metric bio data. This makes it impossible for a person other than the voter to cast a ballot in the elections, and therefore, impersonations are effectively prevented⁽³⁾.

* Electronic voting can contribute to improving the efficiency of the electoral process and increasing confidence in it by reducing administrative errors in the electoral process and providing accurate and complete information on the election results in the form of an instant electronic report. This electronic report saves time and effort on electoral departments, and helps avoid errors that may occur during the counting of votes and the announcement of results, such as manual counting errors, data entry errors or results recording errors.⁽⁴⁾

* It can save costs by reducing the number of polling stations, reducing the cost of printing and distributing ballot papers, and providing access to voters around the world.⁽⁵⁾ Electronic voting can also help eliminate fraud and manipulation of traditional voting processes; Through the use of advanced security technologies, such as: data encryption; Digital signature; Identity verification.⁽⁶⁾

* Electronic voting allows all electoral processes to be conducted very quickly, including voter registration, vote counting, and results announcement. This is because electronic voting is done electronically, reducing the time and effort needed to complete these processes. It also ensures the accuracy of election results, because the process of recording and counting votes is done electronically, reducing the likelihood of human errors.⁽⁷⁾

¹- Hadj Khidar Abbas and Suha Zaki Nur; op.cit; p. 457

²- Mohammed Misbah Muhammad Al-Naji Mohammed; op.cit;P.225

³- Ibid; p.229

⁴- Khanafif Muhammad, Myizi Qawidar; Electronic voting as a proposed model for activating e-governance in Algeria, Journal of Management and Development for Research and Studies, University of Blida, 2 Blida, Algeria, Issue 13, 2018, p. 57.

⁵- International Foundation for Democracy and Elections; Introduction to electronic voting: substantive considerations; Policy Paper 2011; p. 8; Egypt; 2015

⁶- Mustafa Hussein Mohamed Abu Hindi; Legal aspects of electronic voting - comparative study -; Doctoral thesis in law; Faculty of Law; University of Assiout; Egypt; 2022 'p. 56

-Younis Shahim; Electronic voting in elections; Advantages and disadvantages; Journal of Bets; No. 56; p. 25; Centre for Humanitarian Studies and Research; 2021 'Morocco

⁷- Ibid; p. 25

But despite these advantages, electronic voting also faces some disadvantages, which can affect the integrity and accuracy of the electoral process. The main shortcomings include:

- * Weak security: Security is one of the most important challenges facing electronic voting, as the electronic system can be vulnerable to cyberattacks, which can lead to election fraud or change its results.

- * Mistrust: Some voters may feel distrust of electronic voting due to fear of possible fraud or errors in the electronic system.

- * There are many reasons for voters' distrust of electronic voting, such as:

Voters' lack of understanding of how the electronic system works; Fear of being hacked into the electronic system; and insufficient transparency in the electronic voting process.

- * Inequality: Electronic voting may lead to voter inequality; if the electronic system is not available to all voters, or if not all voters are able to use it; voters without computers or smartphones may not be able to vote electronically. Voters who cannot read or write may also have difficulty using the electronic system ⁽¹⁾.

1.3- Various regulations for electronic voting

There are many systems in place around the world for electronic voting. There is electronic voting using paper cards, a direct electronic voting system, an electronic remote voting system and another system based on integration between more than one electoral system. These systems will be detailed in the following elements.

1.3.1- Electronic voting using paper cards

Electronic voting system is done using paper cards by voting using perforated cards and scanning.

A. Vote using perforated cards

In the United States, many voters vote using perforated cards. In this way, the voter marks his or her preferred candidate by piercing the ballot at the designated place.

There are two main types of perforated cards used in the United States:

- Voto matic card: This card has numbers in holes designated places, which refers to the preferred filter. A list of candidates and guidance on how to place holes is printed in a standalone booklet.

- Data vote Card: This card contains the name of the filter in the perforated space.

Pierced cards were first used in the United States in the 1964 presidential primary in two Georgia counties. Although many US states are now replacing pierced card systems with more advanced systems, they are still used by a large proportion of voters in the states

United Nations. In the 1996 presidential election, 37.3% of voters in the United States used pierced cards.

Pierced cards ⁽²⁾ have several advantages, including:

- Ease of use: Voters can easily use them, without the need for special training.
- Cost: Pierced cards are less expensive than some other voting systems, such as electronic voting.

- Precision: Perforated cards can be easily and accurately sorted ¹.

¹- Ibid; p. 19

² - Ibid ;p. 19;

However, pierced cards also have some defects including:

- Possibility of forgery: Pierced cards can be subject to fraud, as voters can puncture more than one hole in the candidate's designated place.
- No re-voting: If the voter puts a wrong hole, he/she cannot re-vote without corrupting the card.
- Need for sorting machines: Perforated cards require the use of sorting machines, which can be expensive.⁽²⁾

b- Scanning systems

Automated voting systems, which use scanners to convert data on ballots into computer-readable data. There are four main types of scanning techniques used in automated voting systems:

- Optical reading of marks: This technique is used to read certain marks on ballots, such as rectangles, circles or arrows.
- Optical identification of letters: This technique is used to convert printed or handwritten text into computer-readable data.
- Intelligent letter differentiation: This technique uses artificial intelligence techniques to improve the accuracy of optical character recognition.
- Image technology: This technology is used to convert images into computer-readable data.

Automated readable voting systems are used in a variety of applications including:

- Ballot counting: These systems can be used to count ballots quickly and accurately.
- Identity verification: These systems can be used to verify identity using facial images or fingerprints.
- Data collection: These systems can be used to collect data from models and other documents.⁽³⁾

1.3.2- Direct electronic voting system:

A-Touch Screen System

In the touch screen system, the voter inserts his own ID number on the device screen. Then the images or codes of the candidates appear on the screen. The voter touches the image or symbol of the candidate he wishes to choose, to be automatically recorded in the memory of the device. This selection is stored unchanged until the vote counting process begins, counts and announces results.

B- Digital Pen System

In the digital pen system, the voter marks a special type paper using an electronic pen. The electronic pen recognizes the letters at the head of the pen, and records them simultaneously on paper. This paper contains blueprints of microscopic dots that allow the

¹- Amani Omar Hilmi; Legal challenges to electronic voting techniques and their impact on the effectiveness of political elections - comparative study - Journal of Legal and Economic Sciences MJ 63; Number 2; p. 8; Faculty of Law; Ain Shams University; Egypt 2021

² - Amani Omar Hilmi; Legal challenges to electronic voting techniques and their impact on the effectiveness of political elections - comparative study - Journal of Legal and Economic Sciences MJ 63; Number 2; p. 8; Faculty of Law; Ain Shams University; Egypt 2021

³- Elections and technology; Website <https://aceproject.org :Elections and Technology dated 27-12-2023 at 14:00>

pen to recognize to the mark position. The data stored inside the pen is then uploaded to a computer and turned into text using special programs. ⁽¹⁾

Third: Electronic remote voting system

C-Online Voting

Online voting is the process of voters casting their electoral ballot in an electronic manner, where a voter inserts their own identification number on an election website. The voter's voice is then sent to election officials online in a confidential and secure manner.

Online voting is done through the creation of a communication portal between the elections' information infrastructure and the Internet. This portal is usually a website that is powerful, dynamic and specially designed to facilitate electronic voting. The portal is linked through secure and highly efficient communication lines with computers, databases and information systems in the elections' information architecture. ⁽²⁾

D-Telephone voting

A telephone voting system is a system that allows voters to express their vote in elections by telephone. The system typically includes a special telephone number that voters can call to provide their votes. After calling the number, the voter is asked to enter his/her own identification number or other information to identify him/her. The voter is then required to choose the candidate he or she wishes to elect. The voter's voice is then recorded and stored in a database. ⁽³⁾

E-Email Voting

It is a system that allows voters to express their vote in elections by email. The system usually involves sending an email to the voter with a link to the voting form. Voters can then vote by clicking on the link and entering their choices. The voter's voice is then recorded; voters can vote from wherever they have Internet access. This makes voting more convenient for people who have difficulty accessing traditional polling stations. Voters with disabilities also help email voting and reduce election-related costs. Reducing the need for polling stations can save money on staff and facilities. ⁽⁴⁾

1.3.4- Integration between more than one electoral system:

Some States have used electronic systems as a partial or complete alternative to traditional systems in conducting elections, and many have relied on more than one electronic system at the same time to complete their electoral processes. (Where the voter determines his choice via a voting device (generally a touchscreen), he prints a paper connection that must be copied with scanner in another device, for example in Belgium) ⁽⁵⁾.

¹- El mistari Muhammad Amin * Abar Omar; Electronic voting and opportunities applied in Algeria .16- Algerian and Comparative Public Law Journal; VIII, No. 02 ˆ .p. 343; Faculty of Law; Aljlali Iyabess University; Sidi Belabas; 2022

²-Mohammed Misbah Muhammad al-Naji.; op.cit ; P.246

³- Mustafa Hussein Mohamed Abu Hindi; op.cit ; P77

⁴-Abdelaali Habal; Electronic voting as international experiences; Algerian Journal of Security and Development; Vol. 8; No. 15; 82; Hadj Lakhdar Batna University; 2019
<https://www.researchgate.net/publication/322095598>

⁵-Saddam al-Mohammadi; Electronic voting and safeguarding the electoral process; A legal study to develop Iraq's experience; On 29-12-2023 at 10:00

See also:

-Ramdani Missika; Electronic voting towards a new path to political participation under digital technology; Research Journal of Academic Studies; Volume 10; Number 02; p. 151; Faculty of Law; Hadj Lakhdar University; Batna; 2023



Through the presentation of electronic voting systems, some countries have developed the application of electronic voting through various media and communication technologies, which vary according to the state's capacity and available capabilities. Algeria, like various countries, seeks to apply electronic voting and may rely on the remote voting system and the Internet.

2- Requirements for applying electronic voting in Algeria

Electronic voting cannot be applied at once, it needs to provide many requirements, the most important of which are: Legal, human and technical requirements, which the various bodies are working to provide in order to ensure the application of electronic voting and take advantage of its advantages, especially in saving effort, money and shortening time in the electoral process. The following elements will provide details on these requirements.

2.1- Legal requirements for the application of electronic voting in Algeria

For the proper application of electronic voting, a legal framework must be provided to regulate this process. It must also modernize the legal regulations already in force and adapt them to developments in order to create an integrated legal system to adapt modern voting techniques.

.2.1.1- Legal framework and basis:

Various States have adapted their legal system to various developments in the field of information and communication technology. Algeria has reviewed some of the legal texts that prevailed prior to the application of e-governance; it has also introduced regulations governing Internet and electronic communications services. As this study focuses on electronic voting, the following elements will define the legal framework and basis for electronic voting:

A-At the level of the Constitution

There is no constitutional provision requiring or prohibiting the use of electronic voting in any State. However, many constitutions contain fundamental principles of the voting process, such as public, confidentiality, equality and freedom to vote. Accordingly, the use of electronic voting is not incompatible with the Constitution as long as it guarantees these principles.

Article 56 of the Algerian Constitution of 1996, as amended in 2020, states: "Every citizen who meets the legal requirements shall have the right to elect and elect"⁽¹⁾

Under article 56 of the Algerian Constitution, the right to vote is guaranteed by the Algerian Constitution and is enjoyed by every citizen of the Algerian Constitution who meets the legal requirements. This right is very important. It gives the citizen the opportunity to influence the political process and identify the person who will represent him and work for his interests.

A citizen is able to choose a representative in power that reflects the principle of democracy and popular governance in the Algerian Constitution.

B-At the legislative level

Electronic voting is required to have a precise legal framework, guaranteeing its freedom and effectiveness, while at the same time imposing strict legal controls to achieve the objectives for which it is established. This requires an integrated legislative system, both

¹ -Presidential Order 20/442 dated December 30, 2020, concerning the promulgation of the Constitutional Amendment, ratified in the first November 2020 referendum, J.J.J.D.S. No. 82, issued on December 30, 2020

flexible and protective, suited to the nature of electronic voting to preserve the characteristics of the legal rule.

Electronic voting can be regulated by amending existing electoral legislation, or by enacting independent electoral legislation. The choice of the most appropriate approach depends on several factors, such as the prevalence of electronic voting in the State.

International experiences in the field of electronic voting vary from State to State; some have passed separate legislation to regulate electronic voting while others have resorted to amending existing electoral laws to add legal texts regulating electronic voting.⁽¹⁾

C- Electronic voting at the level of national legislation:

For Algeria, no legislative text has been issued regulating electronic voting and defining its mechanisms. Although there is no explicit provision regulating electronic voting, there are two mechanisms to reflect the electronic voting project; namely, the Independent National Electoral Authority, the Personal Data Protection Act, the Informatics and Technology Acts and the Law on the Prevention and Control of Crimes Related to Information and Communication Technology.

- Independent National Electoral Authority

The Independent Authority is one of the most important mechanisms introduced in 2019 to reflect the electronic voting project, an independent body for the organization and supervision of elections after the executive authority represented in the Ministry of Interior controlled the organization of elections. Among the tasks and projects that this body seeks to embody on the ground is the task of embodying the electronic voting project on the ground⁽²⁾

02-Act No. 09/04 on the prevention and control of crimes related to information and communication technologies

This Act provides, through its rules, mechanisms to ensure cybersecurity by combating offences against automatic data processing systems⁽³⁾.

This Law has been generally provided without specifying which electronic work is protected through providing electronic security. This Law guarantees the protection of⁽⁴⁾ (electronic administration in general from cybercrime and thus concludes that it also guarantees electronic voting security as a mechanism for the application of electronic administration which is one of the necessary components for the creation of an online government (MARAI & Herbet, 2004).

D-Electronic voting at the level of comparative legislation

There are many international models that have succeeded in applying electronic voting, which Algeria can benefit from in the future; the most important of which are: the United States of America, Switzerland and the United Arab Emirates.

-United States of America

The experience of the United States of America in the field of electronic voting is significant, where several legislations regulating this process has been passed. Perhaps the

¹ -El Mastari Mohamed Amin * Abar Omar; op.cit; p. 348

² -Mohammed Misbah Muhammad Al-Naji Mohamed The legal system for electronic elections is a comparative study; Previous reference pp. 222-257

³ -Act No. 09/04 of 2009/08/05, containing the Special Rules for the Prevention and Control of Crimes Related to Information and Communication Technology, JR No. 47 of 2009/08/16

⁴ -Bertrand DU MARAI and Herbert MAISL discuss e-government and diversity in issue 110 of the Revue française d'administration publique p212

most prominent legislation is the Electronic Government Act and the Act to Assist America's Voting and Exporters. The passage of these laws followed several cases of fraud in the 2000 United States elections, which led to a recount in Florida.

These laws have had a significant impact on stimulating the use of electronic voting, enabling persons with special needs, travellers and soldiers outside the country to vote by email. As a result, 33 of the 50 states of the United States have become authorized to use the system.

The legal framework for electronic voting in the United States of America therefore consists of two main laws

- E-Government Act: This Act aims to facilitate the use of technology in the US government, including the voting process.
- America's Voting Assistance and Issuers Act: This Act aims to help American citizens vote, including those living abroad or people with disabilities.
- Two main types of electronic voting systems have also been used in the United States of America:
 - E-voting by email: This system allows voters to vote from anywhere in the world, provided they have a computer connected to the Internet.
 - Electronic voting at polling stations: This system allows voters to vote on designated computers at polling stations. ⁽¹⁾

-Switzerland:

The Swiss city of Geneva is the first constituency in the world to use the electronic voting system widely. Starting in 2003, Geneva citizens had the option to cast their ballots online. Its citizens are required to vote more frequently, up to 6 times a year, instead of once every two years or more. This is because of the existence of a "direct democracy" system in which any parliamentary elections may be subject to ratification or rejection by citizens.

As a result, Geneva's electoral bodies are under more pressure than their counterparts elsewhere to make the voting process as simple and easy as possible.

In response to these pressures, election officials in Geneva in 1981 implemented a voting-by-mail remote voting system, which quickly became the most popular voting method, thanks to a 41% increase in voting turnout.

The acceptance of the power to vote by mail has somewhat "relaxed" the criteria in terms of the security and public acceptance issues faced by other forms of remote voting; no new system will need to achieve the same level of security and acceptance as voting by mail.

For example, registered voters in Geneva already receive mail-in voting cards containing information that allows them to cast their ballots through return mail. Electronic voting is seen as simply an extension of this well-established service; the system's designers have therefore put in place no technical security measures whatsoever to address potential dilemmas such as the purchase of votes or forced voting, and have merely relied on sociocultural norms and legal mechanisms to protect against this possibility. ⁽²⁾

-UAE

¹ -Al-Borj Mohammed; Electronic voting; Journal of Law and Political Science; 23; 2015p. 68; Ben Zian Ashour University; eldjalfa; 2015

² - Abdelaali Habal; op.cit ; 88;

The United Arab Emirates was keen to achieve excellence and leadership in the elections to the Federal National Council to follow the best modern technological systems, to achieve greater accuracy, integrity and transparency, as well as to facilitate procedures for voters and candidates to carry out a successful election process according to the highest standards.

The previous four electoral cycles (2006, 2011, 2015, 2019) were characterized by continuous development, with each election cycle marked by a number of features, and witnessed a significant development in voting systems and the use of modern technologies and innovative ideas, up to the latest systems used in voting, namely "remote voting" in the 2023 FNC elections.

Electronic Voting

- In the 2006 elections, the electronic voting system was adopted instead of the traditional polling system.
- In the 2011 elections, the electronic voting system was applied in 13 electoral centres nationwide.
- In the 2015 elections, the early voting mechanism was adopted in the elections for the first time.
- In the 2019 elections, the voting system was adopted from outside the state for the second time, increasing the number of polling places to 39.

Remote voting

- In the 2023 elections, the remote voting system was adopted for the first time, a smart voting system that allows a voter to cast a vote from wherever they are both inside and outside the state.
- The hybrid voting system, a hybrid voting system that combines the remote voting system and the electronic voting system has also been introduced in election centres spread across the country's emirates.

Electronic candidate registration system

- In the 2023 elections, for the first time, an "e-registration system" was introduced.

The elections to the Federal National Council of the United Arab Emirates reflect the continuous development of the electoral process in the country. The National Electoral Commission seeks to achieve excellence and leadership in this field and provide the best modern technological systems to facilitate the procedures of the electoral process and ensure its integrity and transparency.⁽¹⁾

¹ - Voting systems in the elections to the Federal National Council.. Facilitating procedures and continuous updates according to the latest technological solutions. † Website

<https://uaenec.ae/ar/media-center/news/6/10/2023>

2.2- electronic voting requirements

2.2.1- Human requirements

- The need for the availability and development of ICT infrastructure, which is important for the implementation of electronic voting techniques and makes it easy to apply to them: The ICT infrastructure is not simply composed of telecommunications equipment and computers, but electronic readiness and overcoming illiteracy are also necessary so that the benefits of electronic voting can be used and seen. Therefore, the desire for education and freedom of access to information is essential to the effectiveness and acceptance by citizens of the use of electronic voting techniques⁽¹⁾ and is done equally among citizens. The inability to provide services over the line to all individuals can hinder the application of the e-administration project⁽²⁾.

E-culture dissemination is one of the most important challenges facing countries in the digital age. With the proliferation and use of modern technology in various areas, it has become essential that individuals and communities have the capacity to use this technology efficiently and effectively.

To disseminate e-culture, awareness must be raised through providing resources for improving the status of legal regulation. This can take place when a range of means and measures are applied including:

- Training individuals in the use of modern technology and sensitizing them on privacy and confidentiality issues to enhance confidence in electronic documents.
- Attention must be paid to e-learning at all stages like providing students with the knowledge and skills needed to use technology. Media awareness-raising campaigns to disseminate e-culture among individuals in order to change the perception of electronic documents.
- International ICT organizations can be collaborated to share experiences and knowledge to enhance e-culture dissemination efforts.

The dissemination of e-culture is one of the most important steps to be taken to promote development in the digital age. In order to achieve this goal, challenges to the dissemination of e-culture must be overcome through a range of appropriate means and measures⁽³⁾.

- **The importance of providing human resources for electronic voting**

The provision of qualified human resources is one of the most important factors ensuring the success of electronic voting. States wishing to apply electronic voting must therefore ensure that the necessary training programmes are provided to those working in this field and that the necessary material and human resources are provided for the implementation of these programmes.

¹ -Noredine Bitat; Nabil Krypsch; Electronic voting techniques are a tool for improving the electoral process; Algerian Journal of Security and Development; Vol. 10; No. 18; p. 420; Faculty of Law; University of Batna; Algeria; 2021

² -Lau Edwin: Key issues of e-government in OECD Member countries, Revue française d'administration publique, l'administration électronique, école nationale d'administration, paris, France , numéro 110 , 2004 , p227

³ -Al-Kodwa Mahmood: E-Government, I, 3 Osama Publishing and Distribution House, Amman, Jordan, 2010 , p. 287

See also*

Alaa Mehiddin, Mustafa Abu Ahmed: E-Administrative Decision, E-Transaction Conference (E-Commerce, E-Government), Faculty of Economics, Trade and Management Sciences, Emirates Center for Strategic Studies and Research, United Arab Emirates, 19/20/2009



The following are the most important requirements for providing human resources for electronic voting:

- All workers must be trained in electronic voting systems, including voters, election officials and staff who will oversee the electoral process. Training includes learning how to use electronic voting systems, knowing electoral laws and regulations, and knowing how to deal with any emergencies that may occur during the electoral process.
- E-voting professionals must be highly efficient in using, controlling and optimizing technology. Through scientific and training qualifications in ICT.
- Electronic voting workers must be prepared to deal with any emergencies that may occur during the electoral process, such as the disruption of the electronic system or the occurrence of a cyberattack.
- Develop specialized training programmes in the field of electronic voting, so as to meet the different needs of workers in this field.
- Provide the material and human resources necessary for the training of electronic voting personnel, such as the provision of computers, networks and training centres.
- Encourage innovation and creativity in electronic voting by developing more user-friendly and efficient voting systems ⁽¹⁾. Hence, Algeria has a broad base of qualified personnel to operate and maintain electronic voting systems. The Algerian Government also has the capacity to train more staff in this area.

In addition, there are many Algerian universities that offer educational programmes in the field of information technology, which can contribute to the preparation of the human cadres needed to apply electronic voting.

Social awareness.

2.2.2-Technical requirements for electronic voting

The technical standard is one of the most important factors affecting the success of the electronic voting process. This standard must reflect the democratic values of elections and address all concerns related to electronic voting including:

- Trust in electronic systems:

Confidence in electronic systems used in the electoral process can be achieved through the ability to address gaps that can arise anywhere in the electronic electoral process, be they gaps in systems or voting methods. Security gaps are inevitable, but can be overcome through the formation of a team trained in the latest technologies and continues throughout the election period. Besides, this trust can contribute to fending off any penetration or addressing any loophole that can infect the system. Initial operations and continuous experimentation of the software and devices used must also be carried out. ⁽²⁾

- Replacing the traditional voter's card with an electronic card:

The trend towards electronic elections in Algeria requires that the traditional voter's card be replaced by an electronic card. It contains an electronic chip, containing all information relating to the voter, such as his or her national number, date of birth, place of residence, etc.

¹ -Belghamel Ali, mezawri nabila; op.cit ; p. 399

² - Omar Abdul Hafiz Ahmed Omar; op.cit ; p. 173

They allow the voting process to be conducted more quickly, easily and safely. It contributes to ensuring the integrity of the electoral process, preventing fraud and fraud. ⁽¹⁾

We can say that Algeria has good potential in terms of technological infrastructure. Internet networks are scattered across the country, and electronic devices are becoming commonly used. The Algerian Government also has IT expertise.

In addition, there are many Algerian companies working in the field of information technology, which can contribute to the development of local electronic voting systems.

- Increased information and awareness campaigns to deal with modern technical means

Time is a critical factor in the application of electronic voting, as electronic voting cannot be applied overnight, and this requires tight planning and execution. The system also needs much longer community acceptance than it takes for technical application alone.

Many electoral cycles are usually required without major technical problems or political controversy, with reliable results and long-term civic awareness campaigns, so that citizens and stakeholders can deposit their full confidence in electronic voting, based on their own experiences and knowledge.

Therefore, the optimal approach to the application of electronic voting is to initiate information and awareness campaigns on voting systems to be applied some time before the start of technical application, with the possibility of formulating the system's technical requirements based on the response of the social context and its concerns. ⁽²⁾

2.2.3-Security requirements for electronic voting systems

The security dilemma is one of the most significant challenges to the widespread application of electronic voting systems in the world's countries and in Algeria in particular. These systems are exposed to potential risks of piracy and sabotage, which can lead to election fraud or change of results, so one of the most important requirements of applying electronic voting is the provision of security requirements, which is done through:

- Providing security against cybersecurity hacking: hackers can hack the electronic system and change or delete election results entirely.
- Preventing manipulation of electoral data: hackers can modify, delete or add electoral data, which can alter election results.
- Integrity of the approved electronic system: The approved electronic system must be secure and reliable, and must have robust security procedures to protect electoral data.
- Operator authentication and certification: The operator's identity must be verified and certified before being allowed access to the electronic system.
- Integrity and reliability of electoral data: Electoral data must be protected from manipulation or deletion, and must be reliable and verifiable.

¹ -Ben yaza Younis; seghiri wahiba; The contribution of the digital environment in support of participatory democracy as a model of teleconference, Journal of Social and Ecological Sciences, University of Batna, 01; Algeria, vol. 20, No. 12019

² -International Foundation for Democracy and Elections; op.cit.; p. 20

- Providing protection systems: Electronic system protection systems must provide against cyber-attacks⁽¹⁾.

In Algeria, the draft electronic vote is still at the beginning of its incarnation and is effectively applied only by providing various means and requirements, especially legal ones. Algeria lacks a legal system for electronic voting, which is the rule of application of this system; Algeria was endeavoring to develop its technical system and human resources to keep pace with developments in the field of information and communication technology with a view to achieving in the near future the application of electronic elections.

Conclusion:

- Electronic voting is the process of voting by using modern technology means, such as a computer or smartphone. It is defined as the exercise of citizens' political right to vote by direct secret universal suffrage, whereby voters can vote from anywhere in the world and at any time of the day.

- Electronic voting can help increase citizens' participation in elections, especially for young people, women and those with special needs. Voters can vote from anywhere in the world, and at any time of the day. Also, the chances of fraud and fraud can be reduced.

- Algeria has good potential to apply electronic voting, but it is necessary to address the challenges that may face the application before it is widely adopted.

- There is a growing awareness of electronic voting in Algeria. Many studies and researches are taking place in this area, and voters' interest in electronic voting is increasing.

Based on the foregoing, the following practical recommendations can be made for the successful application of electronic voting in Algeria:

- The need to give the National Electoral Authority considerable flexibility in adopting state-of-the-art technologies and working jointly with various actors, State institutions and technical experts to establish an electronic voting body; Oversee the correct and safe application of electronic voting, develop its systems according to safe and reliable standards, and conduct awareness campaigns for voters about electronic voting.

- A legal framework for electronic voting must be established according to clear legislative criteria to ensure that the electoral process is fair and transparent and without manipulation of results. Any attempt at forgery or hacking must be punished.

- For the successful application of electronic voting, it should be applied in phases in accordance with a specific national plan.

- The need for pilot studies to test the efficiency of electronic voting systems and their acceptance by voters.

- Algeria can benefit from international expertise and enhance cooperation with States that have successfully adopted this system in order to achieve technological development in the electoral process, with the need to provide funding for the application of electronic voting.

¹ -Abdelaaziz Abdullah Rashid Al-maawda ' ; Electronic voting - between reality and hope; Legal; Number 12; p.

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