



Akademik Eğitim ve Sosyal Bilimler Dergisi (AJESS Journal)

The Role of Digitalization in Enhancing the Integrity of the Electoral Process: Opportunities and Challenges

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Article History

Received : 05/08/2026; Accepted : 15/10/2026 ; Published: 20/10/2026

Abstract:

Digitalization in the electoral process is one of the most significant developments brought about by global technological transformations. Elections are no longer confined to traditional mechanisms; rather, the integration of digital solutions at various stages has become necessary to ensure integrity and transparency. In its broad sense, digitalization encompasses the use of technology in electronic voter registration, campaign management, the adoption of electronic voting systems, and digital vote counting. These dimensions contribute to improving the efficiency of the electoral process and reducing manipulation, thereby positively affecting the performance of elected popular assemblies, which constitute the primary instrument for realizing representative democracy.

On the other hand, electoral integrity emerges as an essential condition for strengthening citizens' trust in state institutions, as the quality of elected assemblies' performance remains closely linked to the transparency of the electoral process. In the Algerian context, the integration of digitalization offers significant opportunities to strengthen voters' trust and improve the image of the electoral process, particularly in light of the legal reforms taking place in the country. However, this approach faces several challenges related to limited digital literacy and concerns about cyberattacks. Accordingly, advancing the prospects of digitalization in the electoral process requires a robust legal framework to ensure fair and transparent elections that enhance the standing of elected popular assemblies.

Keywords: Digitalization, Electoral Process, Electoral Integrity, Elected Popular Assemblies.

Introduction:

Elections constitute one of the fundamental pillars of democracy in any state, as they are the primary means through which citizens choose their representatives. They also serve as a vital indicator for assessing the maturity and stability of a country's political system. Elections are not merely a procedural formality; rather, they are an essential process that directly affects the legitimacy of elected institutions and the extent to which citizens trust the state. From this perspective, electoral integrity and honesty are indispensable, as any shortcomings in the transparency of the electoral process or any manipulation of its results undermine the credibility of institutions and weaken the relationship between citizens and the state.

In light of the technological developments and rapid digital transformations taking place worldwide, it has become necessary to reconsider traditional electoral procedures, which are no longer sufficient to meet the requirements of transparency, accuracy, and speed. International experiences have demonstrated that relying exclusively on traditional systems may lead to delays in announcing results, increased rates of human error, and potential instances of corruption and manipulation. In this context, digitalization has emerged as a strategic tool that can contribute to improving the

electoral process through the integration of digital technology at its various stages, beginning with electronic voter registration, proceeding through electoral campaign management, and culminating in electronic voting and the digital counting of results.

The significance of this research lies in its examination of how the performance and integrity of the electoral process can be improved through digitalization. Digitalization does not merely involve simplifying procedures; it also encompasses enhancing transparency and reducing opportunities for manipulation, thereby improving the performance of elected assemblies and ensuring genuine representation of citizens. Furthermore, the integration of digitalization contributes to strengthening voters' confidence in democratic institutions and encouraging their active participation in the political process, which constitutes an essential factor in consolidating representative democracy in Algeria.

This topic was selected for several reasons, the most important of which is the need to understand the current state of the traditional electoral process and the problems it faces that may compromise its integrity, such as human errors, lengthy vote-counting procedures, and the possibility of result manipulation. The topic also reflects one of the most prominent contemporary challenges in the fields of legal and political sciences, as digitalization has become an integral part of global developments in electoral management. Moreover, the subject has not been extensively addressed in national academic studies, which gives this research scientific value and contributes to enriching the legal and political literature on the integration of technology into elections.

In light of the foregoing, the research problem can be formulated as follows: **To what extent can digitalization contribute to ensuring the integrity of Algerian elections, and what challenges hinder its implementation in practice?**

To address this research problem, the descriptive-analytical approach has been adopted, as it allows for an accurate description of the state of elections in Algeria in terms of transparency and integrity, as well as an analysis of the potential for integrating digitalization into the various stages of the electoral process. The research also employs the comparative approach to examine international experiences in integrating digitalization into elections, with the aim of drawing lessons and formulating recommendations applicable to the Algerian context. The study relies on various sources, including national legislation and international reports, to ensure the accuracy of information and provide a comprehensive, objective analysis.

The study is structured around two main sections. The first examines the theoretical framework of digitalization and electoral integrity, while the second addresses the prospects for and challenges of integrating digitalization into the electoral process.

Section One: The Theoretical Framework of Digitalization and Electoral Integrity

In light of rapid technological development and the digital transformation taking place worldwide, it has become necessary to reconsider how electoral processes are managed in order to ensure their integrity and transparency. Digitalization represents a fundamental tool for improving operational accuracy and reducing human errors, in addition to strengthening trust between citizens and electoral institutions.

This section examines the theoretical framework of digitalization in the electoral process by explaining its concept and reviewing its various fields of application, such as electronic electoral registers¹, digital voting², and electronic vote counting³. It also analyzes the concept of electoral integrity in accordance with international standards and compares the current state of digitalization in Algerian elections, highlighting the gaps and challenges that hinder the full implementation of digitalization. All of this is intended to provide readers with an understanding of the relationship between digitalization and electoral integrity and to demonstrate how digital technologies can become an effective means of ensuring transparency, reducing manipulation, and enhancing voter participation in the democratic process.

¹ An electronic electoral register is **“a digital database containing accurate and up-to-date information on eligible voters, used to facilitate the management of the electoral process and ensure its integrity...”** For further details, see:

Brennan Center for Justice: *Voter Registration in a Digital Age*, USA, 2015, p. 2

² Digital voting is **“a voting process in which electronic means are used to facilitate the casting of votes, whether via the Internet or through electronic voting machines.”** In India, for example, the Electronic Voting Machine (EVM) system has been used since 2004. It consists of two main units: the control unit and the ballot unit. For further details, see:

- Election Commission of India, 2004, *Representation of the People Act*, see: www.indiacode.nic

³ Electronic vote counting is **“the process of collecting and processing votes cast electronically using electronic voting systems or digital databases, with the aim of calculating results rapidly and accurately while reducing human intervention and potential errors.”** For further details, see:

International Foundation for Electoral Systems (IFES): *Electronic Voting Machines (EVMs)*, IFES, USA, 2011, p. 6

First: Definition of Digitalization and Its Dimensions in the Electoral Process

Given the rapid technological development taking place worldwide, integrating digitalization into the electoral process has become necessary to enhance its integrity and transparency. Since elections face challenges relating to the accuracy of electoral registers, the speed of vote counting, and the monitoring of the electoral process, digitalization plays a pivotal role in improving these aspects. Electronic electoral registers, for instance, help reduce errors resulting from duplicate entries or inaccurate voter registration, while electronic voting facilitates participation, particularly for Algerians residing abroad and persons with disabilities.

Furthermore, the use of digital vote-counting systems reduces the likelihood of manipulation and provides accurate data within a short period, thereby increasing citizens' confidence in the integrity of the electoral process. Digital communication and electronic monitoring also enable voters and civil society organizations to follow the conduct of elections, thus enhancing transparency and making the process more accountable.

This section aims to establish a clear knowledge base for understanding the concept of digitalization and its various dimensions in the Algerian context, as well as how these digital tools can become an effective means of enhancing electoral integrity.

1. Definition of Digitalization

Linguistically, the Arabic term for digitalization (raqmana) is derived from the root of the Arabic word "raqam", meaning number or numbering. It is an old term used to denote the process of assigning numbers to things or information, or representing them numerically. This is the root from which the modern term "digitalization" has been derived ⁴.

Terminologically, digitalization is defined as "the process of creating digital copies of physical information, documents, files, and data, thereby enabling them to be processed and stored electronically and improving their accessibility and effective use" ⁵.

It is also defined as "the process of converting printed materials and/or materials stored on microfilm or microfiche, as well as analogue materials, such as audio tapes and video tapes, through scanning and/or re-entry, into digital formats that can be processed by computers. This is achieved by organizing such materials into separate units of data known as 'Bytes' and storing them on internal storage media, such as hard disks, and/or external media, such as laser discs and digital video discs, and/or making them available via the Internet" ⁶.

Another definition describes digitalization as "the conversion of texts, images, and videos into digital formats using computers and software, often in binary form (0 and 1), allowing them to be stored, processed, and transmitted rapidly and accurately" ⁷.

Accordingly, in the technological context, digitalization relies on a range of tools and techniques, such as scanners for converting paper documents into digital files; specialized optical character recognition (OCR) software for converting handwritten texts into searchable and editable digital text; digital databases for organizing and storing information; and encryption technologies for protecting data against breaches or unlawful use. Digitalization also enables the integration of different databases.

From a legal perspective, digitalization is a process with significant implications for the legal system. It refers to the conversion of traditional legal procedures and data into digital formats within a regulated legal framework that safeguards rights and obligations and enables the relevant authorities to manage information efficiently and transparently. This reduces human errors and improves operational efficiency while preserving legal validity and procedural integrity. From this standpoint, digitalization is not merely a technological tool; it has become an essential component in promoting integrity and efficiency and protecting rights in the digital age.

In light of the foregoing, digitalization can be understood as combining the linguistic dimension of converting information into numbers, the technological dimension of processing and storing data digitally, and the legal dimension of regulating its use and protecting rights. These dimensions provide a comprehensive understanding of the meaning and significance of digitalization across various fields, particularly when it is associated with the electoral process, in which the integration of digital technologies constitutes a fundamental requirement for enhancing transparency and integrity.

2. Dimensions of Digitalization at the Various Stages of the Electoral Process

Through Order No. 21-01, containing the Organic Law on the Electoral System ⁸, the Algerian legislator has defined the various fundamental stages of the electoral process, beginning with registration on electoral rolls, proceeding

⁴ Academy of the Arabic Language: *Al-Mu'jam Al-Wasit*, Dar Al-Maaref, Egypt, 1995, p. 567.

⁵ Gradillas Maria: *Distinguishing Digitization and Digitalization (A Systematic Review and Conceptual Framework)*, Journal of Product Innovation Management, Wiley-Blackwell, No. 42, p. 112

⁶ Naglaa Ahmed Yassin: *Digitization and Its Technologies in the Arab Library*, Al-Arabi Publishing and Distribution, Egypt, 2013, p. 21

⁷ Schlumpf Daniel: *Digitization in ScienceDirect Topics*, see: www.Sciencedirect.com

⁸ Order No. 21-01 of 10 March 2021, containing the Organic Law on the Electoral System, *Official Gazette of the People's Democratic Republic of Algeria*, No. 17, dated 10 March 2021, p. 8

through the polling and voting stage, and concluding with vote counting and the announcement of results. While this Order aims to regulate the electoral process from a procedural perspective, integrating digitalization into these stages would add value by improving efficiency and transparency and strengthening integrity.

A. Integrating Digitalization into the Registration Stage on Electoral Rolls

Registration on electoral rolls constitutes the fundamental cornerstone upon which the entire electoral process is based, since the credibility of the subsequent stages cannot be guaranteed without an accurate and transparent electoral register. The Algerian legislator has given particular attention to this stage through the aforementioned Order No. 21-01, devoting Chapter Two, entitled “**Electoral Rolls**,” to Articles 53 to 71, which precisely establish the registration requirements and procedures for periodic revision.

For example, Article 54 of the aforementioned Order No. 21-01 stipulates that: “Registration on electoral rolls is mandatory for every male and female citizen who meets the legally prescribed requirements.” Article 55 of the same Order also requires every Algerian man and woman who enjoys their civil and political rights and has not previously been registered on an electoral roll to apply for registration.

In the same context, Article 63 of the same Order provides that: “Electoral rolls and their periodic revisions, or revisions conducted on the occasion of any electoral or referendum event, shall be prepared in each municipality by a municipal committee responsible for revising electoral rolls...”

Furthermore, Articles 66–69 of the aforementioned Order provide for the submission of a complaint to the chairperson of the municipal committee responsible for revising electoral rolls, thereby establishing an additional legal safeguard for the transparency of the process.

However, a careful examination of these provisions reveals that the Algerian legislator has adopted an approach largely confined to paper-based and administrative procedures, without effectively keeping pace with the requirements of the digital age. Despite their importance, the current procedures remain vulnerable to recurring problems, such as human errors in data entry, duplicate records or multiple registrations, and delays in the revision process caused by slow administrative procedures. This highlights the need to integrate digitalization into this sensitive stage through the following measures:

- Establishing a centralized national electronic electoral register linked to the civil status database, in which all voter-related information is accurately recorded.
- Adopting automatic updating technologies to ensure that deceased voters and those who have moved from one municipality to another are removed from or transferred between the relevant electoral rolls in a timely manner, thereby reducing inflated voter lists and electoral fraud.
- Providing electronic platforms that enable voters to verify their inclusion on electoral rolls and submit applications for registration or correction online, as implemented in international experiences such as those of India and Brazil.

Accordingly, integrating digitalization into the electoral registration stage would not only improve accuracy and speed but also enable citizens to monitor their electoral status with ease. This represents a fundamental step towards establishing an accurate and reliable electoral register that reflects the genuine will of the electorate.

Nevertheless, it should be noted that, although the aforementioned Order No. 21-01 does not explicitly provide for digital registration, the Independent National Electoral Authority has, in practice, established a digital platform known as “*Hifadh Al-Amanah*”, which has enabled citizens to register, verify their electoral status, and change their place of registration remotely. This constitutes a practical step towards the digital transformation of the electoral process in Algeria⁹.

B. Integrating Digitalization into the Polling and Voting Stage

The polling and voting stage constitutes one of the most important components of the electoral process, as it is the stage during which voters express their free will in choosing their representatives. It is also the stage that gives the electoral process as a whole its democratic character. The Algerian legislator has devoted particular attention to this stage in the aforementioned Order No. 21-01, establishing detailed provisions beginning with Article 123. Despite the clarity of this legal framework, the electoral process remains governed by a traditional approach, as it relies primarily on paper ballots and the material and human resources they require. This may give rise to several challenges, such as lengthy procedures and the possibility of human error. In this context, the importance of integrating digitalization into the polling and voting stage becomes apparent, and this can be achieved through **a set of practical mechanisms**, including:

- **Electronic verification of voter identity:** This can be achieved by linking the voter database to biometric identification cards or an electronic fingerprint verification system at polling stations, thereby preventing multiple voting and strengthening confidence in the electoral register.
- **Electronic voting at polling stations:** This involves using digital voting machines that enable voters to select their preferred candidates via an electronic screen, while printing a paper receipt to be deposited in the ballot

⁹ Independent National Electoral Authority, *Hifadh Al-Amanah Platform*. For further details, see the website: <https://services.ina-elections.dz>

box as a backup mechanism. This approach combines the advantages of digitalization with traditional safeguards.

- **Enabling remote voting**, particularly for the Algerian diaspora residing abroad.

Accordingly, integrating digitalization into the polling and voting stage does not aim to eliminate the traditional safeguards established under the aforementioned Order No. 21-01, but rather to develop and adapt them to the requirements of the modern age in a manner that promotes transparency, protects voters' rights, and ensures the integrity of the electoral process in accordance with the specific characteristics of the Algerian legal system.

C. Integrating Digitalization into the Vote-Counting and Results Announcement Stage

The vote-counting and results announcement stage represents the final link in the electoral process, during which voters' ballots are converted into official results identifying the successful candidates and conferring legitimacy on the process as a whole. The Algerian legislator has devoted particular attention to this stage through the aforementioned Order No. 21-01 on the Electoral System, establishing detailed provisions in Article 152 and the subsequent articles. These provisions stipulate that vote counting must begin immediately after polling closes and must be conducted publicly inside the polling station in the presence of candidates' representatives and accredited observers. They also require the preparation of an official record documenting the number of voters, valid and invalid votes, as well as any observations or objections. This record is subsequently transmitted to the competent committees for aggregation. The Independent National Electoral Authority is responsible for announcing the preliminary results, while the Constitutional Court is entrusted with announcing the final results.

In light of the foregoing, it is evident that the Algerian legislator has relied on traditional mechanisms based primarily on paper records, which are transmitted to the competent committees and subsequently referred to the Independent National Electoral Authority for the announcement of preliminary results. However, despite the legal safeguards provided by this approach, it remains distant from the requirements of the digital age and the advanced tools that could make this stage more efficient and comprehensively transparent. This calls for consideration of integrating digitalization into vote counting and the announcement of results as a future-oriented option for strengthening integrity and accelerating procedures.

In this context, several digital mechanisms can be envisaged to improve this stage without undermining the substance of the existing legal safeguards. The most prominent of these include:

- **Adopting electronic vote counting** through specialized devices capable of reading paper ballots rapidly and accurately.
- **Introducing electronically generated records digitally signed** by polling station officials and observers and transmitted immediately to the Independent National Electoral Authority through a secure system.
- **Transmitting results digitally in real time** through a centralized platform that enables the instantaneous aggregation of data and their publication on an official website.
- **Enabling candidates to verify results electronically** through dedicated access codes that allow them to monitor recorded results directly.

Accordingly, integrating these digital tools into the vote-counting and results announcement stage would enhance the effectiveness of the electoral process and provide greater transparency and accuracy while preserving the legal framework established under Order No. 21-01.

Second: Electoral Integrity and the Prospects for Enhancing It through Digitalization

Integrity constitutes the cornerstone of any electoral process, as it represents the criterion by which the legitimacy of elected institutions and the extent to which they genuinely reflect the popular will are assessed. Electoral integrity does not merely mean holding elections on schedule; it also encompasses respect for the principles of transparency, equal opportunities among candidates, administrative neutrality, and the guarantee of the secrecy and freedom of voting. Consequently, any violation of or deficiency in these principles may undermine citizens' confidence in the ballot box and weaken the legitimacy of the announced results.

In this regard, the Universal Declaration of Human Rights emphasizes the integrity of the electoral process and the need to safeguard it as a fundamental pillar of democracy and human rights¹⁰. Similarly, the International Covenant on Civil and Political Rights recognizes citizens' right to vote and stand for election without discrimination and obliges states to take the necessary measures to ensure the freedom and transparency of the electoral process¹¹. These international instruments reflect the international community's commitment to monitoring elections and supporting democratic practices, thereby contributing to strengthening trust between citizens and the state, protecting political and individual rights, and preventing violations or manipulation of election results. Electoral integrity thus becomes not merely a national choice but also a legal and ethical obligation under international conventions.

In the Algerian context, the legislator has sought, through the aforementioned Order No. 21-01, to establish a set of legal and institutional safeguards to protect the integrity of electoral events. The Independent National Electoral Authority has been entrusted with broad powers covering the organization of the electoral process from beginning to end, including the preparation of electoral rolls, the candidacy and electoral campaign stages, vote counting, and the

¹⁰ United Nations, *Universal Declaration of Human Rights*, Paris, 1948

¹¹ United Nations, *International Covenant on Civil and Political Rights (ICCPR)*, New York, 1966

announcement of provisional results. The legislator has also strengthened the role of constitutional adjudication in reviewing final results through the Constitutional Court, which is responsible for ruling on electoral appeals and announcing the final results. These mechanisms reflect a political commitment to establishing the principle of **“free and fair elections”** as an essential condition for building a state governed by the rule of law.

However, despite their importance, traditional safeguards are no longer sufficient to address the emerging challenges posed by the technological environment and growing demands for transparency. This is where digitalization emerges as an innovative mechanism for enhancing electoral integrity. Through its advanced technological tools, digitalization can improve the accuracy of electoral rolls by introducing electronic registers linked to civil status databases, thereby reducing duplicate entries and fictitious voter records. It can also facilitate the use of biometric voter identification cards to verify voters' identities and prevent attempts at manipulation.

Furthermore, the use of digital technologies during the voting and counting stages helps reduce human intervention and the associated risks of error or manipulation. When supported by robust security safeguards, electronic voting can provide speed and accuracy in recording votes and enable voters to track the processing of their ballots securely and transparently. Digitalization also allows the Independent National Electoral Authority to publish results in real time through electronic platforms, thereby strengthening voters' confidence in the integrity of the process and reducing suspicions that may arise from traditional vote-counting procedures.

Nevertheless, the use of digitalization is not without technical and security challenges. Protecting electoral systems against cyberattacks is an essential requirement, while ensuring equal access to technology for all citizens remains crucial to preventing digital exclusion. Digitalization therefore appears to be a double-edged sword: it can enhance electoral integrity when properly implemented, but it may become a source of suspicion if it is not accompanied by stringent standards of governance and data protection.

With regard to electoral integrity in Algeria, the country has witnessed significant constitutional reforms in recent years aimed at strengthening democracy and ensuring the integrity of elections. Article 7 of the 2020 Algerian Constitution stipulates that “Sovereignty belongs to the people, who shall exercise it directly through referendums and through their elected representatives”¹². This reflects the constitutional commitment to the principle of free popular participation. The role of the Constitutional Court, which replaced the Constitutional Council, has also been strengthened in overseeing elections and verifying compliance with electoral laws and other relevant provisions. These reforms are grounded in the principles of transparency, fairness, and impartiality, in accordance with international standards, alongside the aforementioned Order No. 21-01. However, keeping pace with technological transformations requires the gradual and carefully planned integration of digitalization. If implemented with appropriate security and legislative safeguards, this approach could serve as a key driver of public confidence in the electoral process and give practical effect to the principle of “popular sovereignty” in its fullest form.

Accordingly, it is evident that electoral integrity in Algeria currently rests on a set of traditional legal and institutional safeguards. Nevertheless, the evolution of democratic standards and growing demands for transparency necessitate expanding these safeguards through the effective use of modern digital tools. Digitalization is no longer merely a technological option; it has become a necessity for rebuilding trust between citizens and the ballot box. This highlights the importance of proceeding to an examination of the prospects for and challenges of integrating digitalization into the electoral process, as a decisive step towards establishing electoral integrity that meets the requirements of the modern age.

Section Two: Prospects for and Challenges of Integrating Digitalization into the Electoral Process

While the first section examined the theoretical framework of digitalization and its relationship with electoral integrity, the second section adopts a more practical approach by exploring the prospects for digitalization in Algerian elections and identifying the main challenges hindering its implementation. Digitalization is no longer merely a technological option; rather, it has become a strategic approach adopted by modern electoral systems to enhance transparency, ensure the speed and accuracy of procedures, and broaden the scope of citizen participation.

However, integrating digitalization into the Algerian context requires the establishment of an appropriate legal and institutional environment capable of accommodating technological transformations while addressing challenges related to the protection of personal data, securing digital platforms against cyberattacks and manipulation, and overcoming the digital divide, which may undermine the principle of equality among voters.

Accordingly, this section examines, on the one hand, the legal and institutional capacities available for digitalizing the electoral process and, on the other, the challenges facing this process, with a view to exploring the future of Algerian elections in the context of digital transformation.

First: The Legal and Institutional Capacities for Digitalizing the Electoral Process

As part of the reform of the electoral system, the Algerian legislator has recognized the importance of adapting legal provisions to the requirements of transparency and integrity. In this regard, the aforementioned Order No. 21-01 on the Electoral System established a new phase by strengthening the powers of the Independent National Electoral Authority

¹² Presidential Decree No. 20-442 of 30 December 2020, promulgating the constitutional amendment approved in the referendum of 1 November 2020, *Official Gazette of the People's Democratic Republic of Algeria*, No. 82, dated 30 December 2020, p. 3

as the central body responsible for managing the various stages of electoral events. It can therefore be argued that this legislative and institutional framework provides a fundamental basis for digitalizing the electoral process, even though implementation remains at an early stage.

1. Legal Capacities for Digitalizing the Electoral Process

The aforementioned Order No. 21-01 contains several provisions that can provide a legal foundation for integrating modern technology into elections, including the following:

- Regulating registration on electoral rolls on the basis of civil status records and linking them to the national identification number, thereby opening the way for the establishment of an accurate digital database.
- Providing for the preparation of official records at all stages of the electoral process, including registration, polling, vote counting, and the announcement of results, with the possibility of developing these records into electronically generated and digitally signed documents to ensure greater speed and security.
- Emphasizing the principles of transparency and the protection of candidates' and voters' rights, which is consistent with the requirements of digitalization, including the expansion of digital tracking and monitoring mechanisms.

2. Institutional Capacities for Digitalizing the Electoral Process

The institutional dimension, alongside the legal dimension, plays a central role in implementing digitalization. This is reflected in the following:

- **The Independent National Electoral Authority**, which has been granted extensive regulatory and supervisory powers, making it well positioned to adopt information systems and digital platforms for monitoring the various stages of the electoral process.
- **The Constitutional Court**, which is responsible for announcing the final results and could benefit from the introduction of digital systems to enhance transparency.
- **The possibility of establishing national electronic platforms** that enable voters to follow registration procedures, voting arrangements, and the announcement of results.

The foregoing demonstrates that the existing legal and institutional framework provides an initial foundation for integrating digitalization. Nevertheless, further developments are needed, including explicitly providing for the use of digital tools in preparing official records and transmitting results, establishing mechanisms to protect personal data and electoral information, and strengthening the technical and human capacities of electoral bodies so that they can effectively manage complex digital platforms.

It is therefore evident that Algeria possesses a legal and institutional foundation from which the digitalization of the electoral process can proceed. However, the effective realization of these capacities remains dependent on the ability to adapt the existing legal provisions to contemporary technological realities.

Second: Challenges Facing the Implementation of Digitalization in the Electoral Process

Although the integration of digitalization into the electoral process opens up promising prospects for enhancing transparency, speed, and efficiency, the Algerian experience faces a number of obstacles that hinder the full transition to an integrated digital electoral system. These challenges vary across technical, legal, and institutional dimensions, as well as social factors related to voters' awareness and trust in technology.

1. Technical Challenges:

Cybersecurity is considered the most prominent challenge amid the growing risks associated with attempts to hack and manipulate electronic systems. Elections constitute a sensitive target for any external or internal interference that could affect the results. Furthermore, Algeria's digital infrastructure remains unevenly developed between major cities and remote areas, which may affect the effectiveness of extending digital systems to all polling stations.

2. Legal Challenges:

Order No. 21-01, referred to above, established a general framework for ensuring electoral integrity; however, it did not explicitly provide for all the digital mechanisms that could be introduced. The absence of clear provisions governing the adoption of electronic records or the electronic counting of votes creates a legal gap that may hinder the full integration of technology. Moreover, the protection of voters' personal data remains one of the most significant issues requiring careful legislative consideration.

3. Institutional Challenges:

The implementation of digitalization requires strengthening the capacities of the Independent National Electoral Authority by equipping it with advanced technological tools and training qualified personnel capable of managing them. Furthermore, the judiciary, as the ultimate guarantor of electoral results through the Constitutional Court, needs digital mechanisms to simplify the examination of electoral appeals and accelerate the announcement of results.

4. Social and Cultural Challenges:

The success of any digital transformation is fundamentally linked to the extent to which citizens accept it. Some voters may lack sufficient technological awareness or may not trust the integrity of digital technologies, thereby raising the issue of building digital trust. Furthermore, the digital divide between generations or geographical areas may deepen the sense of exclusion among certain voters unless digitalization is accompanied by comprehensive awareness-raising and training campaigns.

Finally, it should be noted that these challenges do not imply that the digitalization of elections in Algeria is impossible. Rather, they underscore that the transition towards this model requires a comprehensive strategic vision that takes into account legal, institutional, technical, and social dimensions collectively. Comparative experiences have demonstrated that digitalization is not merely an administrative decision, but an integrated process requiring political will and investment in infrastructure and human resources.

Conclusion

Through the examination of digitalization and the integrity of the electoral process in Algeria, it has become evident that integrating technology into the electoral process is no longer a secondary technical option, but rather a necessity imposed by contemporary developments and the demands of transparency. The first section demonstrated that digitalization, in its various dimensions, is closely linked to the principle of integrity by ensuring data accuracy, accelerating procedures, and expanding citizens' oversight of the electoral process. Order No. 21-01, containing the Organic Law on the Electoral System, also showed that the Algerian legislator continues to rely largely on traditional mechanisms, despite introducing certain reforms that may be regarded as a foundation for launching a more advanced digitalization process.

The second section revealed the existence of genuine legal and institutional capacities that could facilitate a successful digital transition, particularly through the pivotal role of the Independent National Electoral Authority and the flexibility afforded by the legal text to incorporate modern mechanisms into voter registration, voting, and counting. However, these capacities face substantial challenges, most notably the inadequacy of the legislative framework in explicitly providing for digital tools, the need to train qualified human resources, the vulnerability of information infrastructure in certain areas, and the challenge of building digital trust among voters.

Based on the foregoing, a number of findings can be drawn from this study, which seeks to clarify the extent to which digitalization contributes to enhancing the integrity of the electoral process while highlighting the available opportunities and the accompanying challenges.

1. Digitalization constitutes an effective mechanism for enhancing electoral integrity; however, it does not replace traditional legal and institutional safeguards, but rather complements them.
2. Order No. 21-01, containing the Organic Law on the Electoral System, established general foundations for reforming the electoral system, but has not yet achieved comprehensive regulation of digital elections.
3. The successful digitalization of elections requires an integrated vision encompassing the legal, technical, institutional, and social dimensions.
4. Public trust remains the cornerstone of any digital transformation, making it necessary to involve citizens and political parties in monitoring the electoral process through transparent and secure platforms.

Based on the findings of this study concerning the role of digitalization in enhancing the integrity of the electoral process, there is a clear need to put forward practical and strategic recommendations aimed at maximizing the opportunities offered by digitalization and addressing the associated challenges. These recommendations are as follows:

1. The need to review Order No. 21-01, containing the Organic Law on the Electoral System, by adding explicit provisions authorizing the use of digital tools for voter registration, the preparation of official electoral records, and the transmission of results.
2. Establishing legal mechanisms to protect personal data and determine the responsibilities of the entities responsible for managing electoral data.
3. Investing in digital infrastructure, particularly in remote areas, to ensure equal opportunities for all voters.
4. Providing continuous training for the personnel of the Independent National Electoral Authority and connecting the Authority to secure information networks capable of addressing cyber threats.
5. Organizing nationwide awareness campaigns to inform citizens about the benefits of digitalization and strengthen their confidence in the integrity of the electoral system.
6. Drawing on comparative experiences while adapting them to Algeria's specific circumstances in a manner consistent with constitutional values and national sovereignty.

In conclusion, Algeria possesses genuine prerequisites for transitioning towards gradually digitalized elections. However, this transition remains conditional upon the State's ability to address the challenges and ensure a balance between the requirements of modern technology and the principles of constitutional legitimacy. Digitalization is not an end in itself, but rather a means of strengthening democracy and fostering citizens' trust in the value of their votes, thereby consolidating the foundations of the rule of law and institutions.

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