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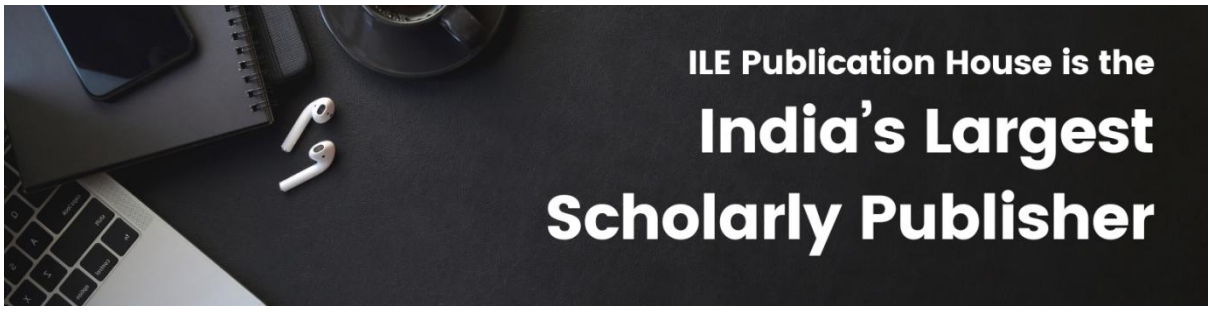

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GLOBAL TRENDS IN THE ADOPTION AND REJECTION OF EVMS: A COMPARATIVE CONSTITUTIONAL AND LEGAL ANALYSIS

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Introduction

The adoption and withdrawal of EVMs worldwide do not seem to follow a uniform pattern. It was influenced by distinct constitutional standards, institutional traditions, individual experiences of electoral fraud, and a balance between technology and governance. Since the "first implementation of electronic voting devices in the 1970s and 1980s, global democracies experienced diverse attitudes toward the system, ranging from strong support as a solution for the operational flaws and risks of paper ballot elections to suspicion or complete disapproval of a technology that removes the paper record from the voter and the auditor." Understanding this global context is essential for an accurate evaluation of India's transition from ballot paper to EVMs and voter-verified paper audit trails. [1252]

The global standard for electronic voting was created using instruments from the Council of Europe, the Organisation for Security and Co-operation in Europe, and the Venice Commission. [1253]

"The Council of Europe's Recommendation Rec. 2004/11 on Legal, Operational, and Technical Standards for e-voting; The Technologies; The OSCE/ODIHR Handbook for the Observation of New Voting Technologies; The Venice Commission's Code of Good Practice in Electoral Matters." [1254]

These organizations collectively establish a framework of "verifiability, transparency, auditability, reliability, security, and accessibility" for evaluating national electronic voting systems. These worldwide norms, non-binding in international law, serve as authoritative benchmarks that have shaped the design of national EVM systems and the scrutiny of them by courts.

This chapter looks into global trends in the adoption and rejection of EVMs and offers a detailed review of the constitutional and legal protections for electronic voting across five jurisdictions: the United States, Brazil, Germany, the United Kingdom, and Venezuela.

These five jurisdictions represent the core models of EVM governance: adoption with a paper trail (United States), lack of public verifiability, which led to judicial rejection (Germany), a gradual adoption with constitutional limits (United Kingdom), a broad adoption with a strict audit (Brazil), and adoption within a compromised framework that led to controversy (Venezuela). The study aims to clarify the conditions necessary for electronic voting to meet the criteria of free and fair elections.

[1252] International Institute for Democracy and Electoral Assistance (International IDEA), Electronic Voting: A Summary of the International IDEA Handbook (International IDEA, Stockholm, 2011), pp. 1–5.
[1253] Ibid., para. 29
[1254].OSCE/ODIHR, Handbook for the Observation of New Voting Technologies (n 1) 11–17.

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Global Trends in the Adoption and Rejection of EVMs

The Initial Wave: Adoption in the 1990s and Early 2000s

The first stage of EVM adoption happened in the 1990s and early 2000s. It was driven by three main factors.

1. the need to speed up vote counting and get rid of human errors
2. to reduce the chances of paper-based electoral fraud (like ballot stuffing, ballot destruction, and miscounting) that affected elections in many developing democracies
3. The belief that digital technology offered better technical solutions than traditional methods.

Brazil established the framework of a full national electronic voting system, finishing the nationwide installation of electronic machines (the Urna Eletrônica) by 2000. India initiated EVM deployment in 1998 and universal adoption by 2004. Venezuela implemented electronic voting for national elections in 1998. "Multiple jurisdictions in the United States implemented DRE machines in response to the controversial 2000 presidential election and enacted the Help America Vote Act in 2002." [1255]

The main feature of the first EVM systems was direct-recording electronic devices that did not provide a paper record for voters to verify their choices. A voter would submit the vote by pressing a button, the EVM would instantly document it, and the outcome would be determined only by the electronic record, with no manual verification. "The absence of verification in this structure represented a constitutional drawback of first-wave EVM systems; it placed the entire confidence of the electoral outcome in a record that could not be verified by voters, candidates, or auditors without technical access to the machine software."

The Second Wave: Rejection and Retreat, 2005-2015

The second wave was marked by a decrease in support, as doubts regarding the verifiability and security of EVMs became popular in academic, political, and legal discussion. The Federal Constitutional Court of Germany, "in a landmark decision in 2009, ruled that using EVMs in federal elections was illegal because people couldn't verify the results, setting an important legal standard against paperless direct recording electronic (DRE) voting."[1256] The Netherlands, having utilized EVMs since 1991, "withdrew all machines from national elections in 2008 after security researchers revealed that the machines could be tampered with without leaving physical proof."[1257] Ireland, spending a lot of money on an electronic voting system, decided not to use it because an independent commission found it "insecure and unreliable," getting rid of the machines completely. [1258]

A push from computer scientists, social workers, and the Verified Voting Foundation in the United States led to a decline in the use of paperless DRE voting in many states, with a requirement for a paper record that voters can verify in forty-three states by 2023.[1259] In the United Kingdom, trials of electronic voting in local elections in 2002 and 2003 did not lead to it being used widely,[1260] and a 2007 report from the Electoral Commission recommending against electronic voting prevented any further plans to use EVMs in British elections. [1261] The lesson from the second wave was uniform across jurisdictions: the democratic legitimacy of an electronic voting system demands that its

[1255] Help America Vote Act of 2002, Pub. L. 107-252, 116 Stat. 1666

[1256] Bundesverfassungsgericht [BVerfG] [Federal Constitutional Court], Mar. 3, 2009, 2 BvC 3/07, 2 BvC 4/07 (Ger.).
[1257] Dutch Ministry of the Interior and Kingdom Relations, Press Release on Withdrawal of Electronic Voting Machines, Oct. 2008 (Neth.).
[1258] Commission on Electronic Voting, First Report, Apr. 2004; Second Report, July 2006 (Ir.).
[1259] Verified Voting Foundation, The State of Voting: 2023 (U.S.).
[1260] Electoral Commission, Key Findings from Pilot Schemes of Electronic Voting, 2002–2003 (U.K.).
[1261] Electoral Commission, Electronic Voting: Findings and Recommendations, 2007 (U.K.).

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outcomes be verifiable, which, at a minimum, requires an independent paper record.

The Third Wave: Paper-Based Electronic Voting and Hybrid Systems

The third wave is not complete denial of electronic technology in elections but a shift to paper-based electronic voting systems. In such systems, a paper ballot, whether hand-marked or machine-printed, serves as the official record of each vote, with electronic technology used only for tabulation and not for direct recording. Optical scan systems have become the most common way to vote in the United States. Voters fill out a paper ballot, which an electronic scanner then reads.[1262] The Philippines implemented an optical mark reader-based election system in 2010 and has continued to use this hybrid model in consecutive elections. [1263] The VVPAT system in India was gradually introduced starting in 2013 and fully implemented in 2019. The electronic count of the EVM serves as the primary record, while a separate paper audit trail is produced for each vote and is obtainable for verification. [1264]

The global agreement from the three phases of EVM adoption and rejection can be summarized in the standard framework set forth by the Venice Commission's Code of Good Practice in Electoral Matters: electronic voting systems must be guided by the principles of reliability, accuracy, security, verifiability, and transparency, must undergo audits by individuals without technical expertise, and must generate a paper record that can function as the record in case of a dispute. [1265]

Systems that hold to these characteristics have often faced constitutional scrutiny; those lacking in these aspects, especially regarding verifiability, have been dismissed by constitutional courts, legislative bodies, or public opinion.

The United States of America: Decentralized Regulation and the Shift to Paper

Constitutional Framework and Decentralized Electoral Administration

The electoral framework in the United States is characterized by its decentralization: the Constitution assigns primary responsibility for election administration to individual states, while This includes maintaining constitutional guarantees such as "equal protection under the Fourteenth Amendment, prohibitions against racial discrimination in voting under the Fifteenth and Twenty-Fourth Amendments, women's suffrage under the Nineteenth Amendment, and the right to vote at eighteen under the Twenty-Sixth Amendment," as well as a limited authority as outlined in Art. I, Section 4 (the Elections Clause) and Art. II, Section 1 (pertaining to presidential elections). No federal voting technology standard holds constitutional authority, such as the regulation of voting machines, which is primarily governed by state law, adhering to the minimum federal standards set forth by the "Help America Vote Act of 2002 and the criteria established by the Election Assistance Commission." [1266]

This decentralization has resulted in a varied choice of voting technologies. As of 2024, the United States employs, across its approximately 10,000 distinct local election jurisdictions, optical scan systems with hand-marked paper ballots, ballot-marking devices with voter-verified paper trails, DRE machines with VVPAT printers, and, in a limited and diminishing number of jurisdictions, paperless DRE machines. And the variety of technologies employed represents a sort of democratic resilience; a systemic weakness in one type of machine impacts just the jurisdictions using it. It also contributes to

[1262] Verified Voting Foundation, The State of Voting: 2023 (U.S.).
[1263] Commission on Elections (COMELEC), Automated Election System Reports, 2010–2019 (Phil.).
[1264] *Election Commission of India, Status Paper on EVMs & VVPATs, 2017 (India).*
[1265] Code of Good Practice in Electoral Matters: Guidelines and Explanatory Report. Adopted at its 52nd Plenary Session (Venice, 18-19 October 2002), CDL-AD (2002)023rev2-
[1266] U.S. Department of Justice, Civil Rights Division. "Introduction to Federal Voting Rights Laws." Justice.gov. justice.gov.

administrative complexity and public confusion.[1267]

The Help America Vote Act of 2002 and the Federal Minimum Standards

The Help America Vote Act of 2002 (HAVA) "established minimum standards for these machines and allocated funding to replace traditional punch-card and lever voting machines, following the crisis caused by the 2000s presidential election in Florida." The provisions of HAVA regarding voting technology include the mandate for "each voting system to generate a permanent paper record with manual audit features," the requirement for voters to have the opportunity to alter their ballot before casting it, accessible voting systems for individuals with special needs, and the establishment of the bicameral Election Assistance Commission (EAC) to oversee the certification standards for federal voting systems. [1268]

State Legislation and the Increasing Rejection of Paperless DRE Voting

In the twenty years since HAVA, state legislation has gradually dismissed paperless DRE voting, marking the notable advancement in American voting technology. Most states have passed laws mandating that all electronic voting systems should provide a paper record that voters can verify, which means replacing paperless DRE machines with either optical scanner systems or DRE machines that have VVPAT printers. "Georgia's 2019 law replaced all its paperless AccuVote-TSX DRE machines with Dominion Voting Systems ballot-marking devices because of ongoing public issues and lawsuits, showing a trend that many other states are also following." [1269]

By 2024, forty-three states enforced a voter-verifiable paper record, while the remaining states are at different phases of moving away from paperless systems. "The EAC's 2022 Election Administration and Voting Survey indicated that paperless DRE machines are now 8 percent, which is a decline from 30 percent seen in the mid-2000s." [1270]

Judicial Oversight and Constitutional Litigation

The debate on voting technology in the United States has been marked by the complexities of American federalism and the range of legal standards in different states. Courts have usually stayed away from imposing technological requirements under the federal Constitution, as state law has the power to govern over the matter by following principles of equal protection and due process. The Supreme Court's 2019 decision in "Rucho v. Common Cause" highlights the limits of federal courts in enforcing constitutional criteria on state election management, as it deals with electoral manipulation. [1271] Constitutional challenges to voting systems have mostly settled in state courts, using state constitutional standards, and in federal courts, invoking HAVA's statutory provisions rather than constitutional directives.

Brazil: Integral Adoption with a Constitutional Audit Framework

Constitutional Framework for Elections and Electoral Equity

Brazil's electoral framework is characterized by a judicial branch called "Electoral Justice" (Justiça Eleitoral), which holds authority over all aspects of the electoral process, including voter registration, candidate certification, campaign funding regulation, and the dispute resolution following the vote. "The Superior Electoral Court (Tribunal Superior Eleitoral, TSE) is the highest authority in this system with seven justices selected from the Supreme Court (Supremo Tribunal Federal), the Superior Court of Justice (Superior Tribunal de Justiça), and legal professionals. Brazil's constitutional framework stands apart from all other nations because of

[1267] EL PAÍS English, From Dominion to Optical Scanners: What You Need to Know About Voting Machines, Oct. 30, 2024 (U.S.).
[1268] Help America Vote Act of 2002, Pub. L. 107-252, 116 Stat. 1666
[1269] Georgia Election Law, H.B. 316, 2019 Gen. Assemb., Reg. Sess. (Ga.).
[1270] U.S. Election Assistance Commission, Election Administration and Voting Survey, 2022 (U.S.).
[1271] Rucho v. Common Cause, 588 U.S. 684 (2019)

the TSE's broad jurisdiction over the election process, which includes developing, certifying, and auditing the electronic voting system."[1272]

The regulating provisions of elections in Brazil are given in:

Art. 14: sovereignty of the citizens, universal suffrage, direct and secret voting

Art. 17: legal framework for political parties

Art. 121: Jurisdiction of electoral justice

Arts. 120-122: the structure and authority of the electoral courts

Art. 14's guarantee of direct and secret vote through universal suffrage serves as the constitutional standard for evaluating the electronic voting system. TSE's jurisdiction under Art. 121 to rule on electoral disputes and decide if the electronic voting system meets this constitutional standard. The framework of electoral justice provides Brazilian courts with a more active role in supervising electronic voting compared to the United States or Germany.

The Electronic Urn: Development and National Implementation

Brazil's Urna Eletrônica is the most widely used electronic voting system globally given the number of registered voters. "In 1996, the system initially tested municipal elections in the state of Santa Catarina, using approximately 40,000 machines." It was gradually broadened throughout the 1990s and achieved full national implementation in the 2000s municipal elections, marking the first instance of all Brazilian voters casting their ballots electronically. The system employs a dual-component system: a keypad terminal within the voting booth allowing the voter to input the number code of their candidate and a display that verifies the candidate's name and image in advance of the electronic registration of the vote. The machines are produced by two Brazilian firms, Unisys do Brasil and Diebold Procomp, under agreements with the TSE. [1273]

The major objective for implementing nationwide electronic voting was with the aim to eliminate paper vote frauds, including ballot stuffing, ballot destruction, and intentional miscounting, which has affected Brazilian elections before, especially at local levels. The success of the Urna Eletrônica in preventing these types of fraud was recorded by the TSE in later post-election reports and acknowledged for its public trust in the credibility of Brazilian elections. Brazil represents the most favorable case study supporting the notion that EVM adoption serves as a constitutional remedy to the vulnerability of paper ballot elections to organized fraud.

Legal Protections and the Audit Structure

The legal framework for the Urna Eletrônica is set by the 'Lei das Eleições' (Law No. 9.504 of 1997), and the regulations of the TSE are made under its constitutional authority. "Law No. 9.504 mandates that the TSE perform public testing of the electronic voting system in advance of each election (the "teste de segurança"), grant political parties and civil society organizations access to the source code of the voting software, and execute a parallel vote tabulation test (the "teste de autenticidade") on election day using a random sample of machines. TSE Resolution No. 23.741 of 2023 provides a full list of these standards, including the rules for the annual hacking challenge that security researchers from universities and tech companies can take part in." [1274]

The most unique feature of the Brazilian system is its distribution of a paper receipt (comprobante de votação) for each vote cast, which the voter can inspect through a glass screen to confirm the selection before the slip is automatically removed and stored in a sealed compartment within the machine and used for audits later. This is functionally similar to the Indian VVPAT. "The 2022 post-election report has confirmed the integrity of the electronic tally, and certain claims of fraud were disproved

[1272] Election organization and TSE's role: Election Process in Brazil
[1273] Development history (1995 design, 1996 use, TSE-led project)
[1274] Lei das Eleições (Law No. 9.504/1997)

after the controversial presidential elections won by Luiz Inácio Lula da Silva."[1275]

The 2022 Electoral Crisis and the Robustness of the Constitutional Framework

The 2022 presidential election marked an intense assessment of the Urna Eletrônica's framework in its 33-year history. After the defeat of Jair Bolsonaro, who often challenged the integrity of the electronic voting system, the political landscape in Brazil shifted significantly. with his supporters alleging machine-level fraud and calling for the cancelation of the results. But TSE showed full transparency by sharing detailed technical documents, making the digital signatures and values of the machine software available for checking, and having technical audits done by the Federal Police, the Army, and outside security experts. [1276]

The outcomes of these audits affirmed the Urna Eletrônica's integrity; every technical verification conducted after the 2022 elections validated the accuracy of the electronic tally and showed no evidence of machine alteration. The TSE's legitimacy as an institution, as well as the legal framework, proved sufficient in the midst of long-standing political opposition to electronic voting. The event of 2022 serves as a relevant case study for the Indian EVM. It highlights the importance of a proper audit framework for electronic voting and emphasizes the necessity of institutional autonomy and transparency to uphold public trust in the system during political instability.

Germany: Constitutional Denial Based on Public Verifiability

Constitutional Framework: The Fundamental Law and the Principle of Democracy

The Basic Law (Grundgesetz), established in 1949 as the constitutional basis of the post-war democratic state, regulates Germany's electoral system. "The Basic Law (Grundgesetz) guarantees broad, direct, free, equal, and secret elections for parliamentary members through Art. 38(1)."[1277]

Art. 20(1) defines the Federal Republic as a democratic and social federal state

Art. 20(2) provides that all state authority comes from the citizens, who shall exercise it through elections and other voting processes through selected legislative, executive, and judicial entities.

The Federal Constitutional Court (Bundesverfassungsgericht, BVerfG) has interpreted these provisions to mandate that elections be technically accurate and publicly verifiable by citizens without any technical knowledge, which is consistent with the principle of Öffentlichkeit (publicity) in elections.

The system of election law in Germany is influenced by the historical background of the Weimar Republic, in which its democratic frameworks were weakened by legally authorized procedures from 1930 to 1933. The drafters of the Basic Law crafted the constitutional structure of Germany to prevent internal institutional control, and this decision influenced the BVerfG's electoral jurisprudence. The need for elections to be publicly verified without requiring technical expertise is not simply a procedural choice; it reflects a dedication to the principle that democratic legitimacy must be built on processes that are clear and reliable to the public and not limited to technical experts. [1278]

The 2009 Federal Constitutional Court Ruling

The decision made by the Federal Court on 3 March 2009 in the joint cases "2 BvC 3/07 and 2 BvC 4/07 is a landmark decision about the constitutional boundaries of electronic voting in any democratic country." The cases arose from disputes about the use of Nedap ES3B electronic voting equipment in around 40 seats during the

[1275] *Tribunal de Contas da União, Auditing Brazil's Electronic Voting System, 2021–2023 (Brazil).*
[1276] *Tribunal Superior Eleitoral, Auditorias Técnicas do Sistema Eletrônico de Votação, 2022 (Brazil).*
[1277] Grundgesetz für die Bundesrepublik Deutschland [Basic Law], May 23, 1949, BGBl. I at 1 (Ger.).
[1278] Peter C. Caldwell, Popular Sovereignty and the Crisis of German Constitutional Law: The Theory & Practice of Weimar Constitutionalism, 1920–1933 (Duke Univ. Press 1997).

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2005 Bundestag elections. The petitioners argued that "using these machines violated their constitutional right to have an election that can be reviewed, as stated in Art. 38 and the democratic idea in Art. 20 of the Basic Law." [1279]

The Federal Constitutional Court agreed with the complaint. The court's main decision stated that the rule for public oversight in elections requires that all parts of the voting process, like voting, counting, and calculating the results, must be able to be checked by citizens without any technical knowledge. The Nedap electronic voting devices that were in use did not meet this requirement because a voter lacking technical knowledge could not verify the recording and count of the votes cast by themselves. The court affirmed that using computers in elections isn't against the law but decided that any electronic voting system used in German elections must allow regular citizens to check the electronic records on their own. The court suggested that this standard could be satisfied by a system where the computer produces a paper record that the voter can verify and that can be manually counted if necessary. [1280]

Implications and the Reversion to Paper Ballots

The consequence of the "BVerfG's 2009" ruling was the total elimination of all electronic voting equipment from German federal elections. The Federal Electoral Act required paper ballot elections at the federal level, and no EVMs have been utilized in any Bundestag election since 2005. The Bundestag elections of 2009, 2013, 2017, 2021, and 2025 used paper ballots, which were manually counted, with electronic technology employed for the reporting and outcome tabulation only. Germany's transition to paper ballot elections following the 2009 verdict has achieved almost complete voting. Support in the country shows a constitutional solution for the verifiability failure of DRE voting. [1281]

The regulations adopted in Germany in 2009 become a standard for discussions on electronic voting in several other jurisdictions. The BVerfG's requirement for citizen verifiability without technical skills reflects execution of the principle that electoral validity must be founded on public trust and understanding rather than relying on the guarantees of technical experts or governmental certification institutions. This test is stricter than the position in the Indian Supreme Court in N. Chandrababu Naidu, which recommended the EVM-VVPAT system based on technical audits and institutional control rather than citizen-level verifiability and serves as a valuable standard for assessing the efficacy of any electronic voting framework.[1282]

The United Kingdom: Constitutional Modernity and the Tradition of Paper Ballots

Constitutional Structure for Elections

The electoral system in the United Kingdom is distinctive because it doesn't have a written constitution. "It depends on statutes, conventions, and common law." The legal foundation is the "Representation of the People Act 1983, along with its various amendments and related regulations, which requires paper ballots as the main voting method in parliamentary and local government elections." [1283] The 1983 Act lacks authorization for electronic voting in parliamentary elections; the implementation of electronic voting would require legislation to amend the Act. The constitutional body of the United Kingdom, which is committed to the value and simplicity of the paper ballot as a safeguard of electoral integrity, has objected to the use of electronic voting. [1284]

[1279] Bundesverfassungsgericht [BVerfG] [Federal Constitutional Court], Mar. 3, 2009, 2 BvC 3/07, 2 BvC 4/07 (Ger.).
[1280] Christoph Engel, Verfassungsrechtliche Anforderungen an elektronische Wahlgeräte, 64 JuristenZeitung 421 (2009) (Ger.).
[1281] Consejo Nacional Electoral (CNE) de Venezuela, 'Sistema de Automatización Electoral: Descripción Técnica' (CNE, Caracas, 2012), pp. 3–12.
[1282] Ley Orgánica de Procesos Electorales (LOPRE), Gaceta Official No. 39.483, 12 de agosto de 2010 (Venezuela), Arts. 159–175.
[1283] Representation of the People Act 1983, c. 2 (U.K.).
[1284] Carter Center, 'Observing Venezuela's Presidential Recall Referendum: August 2004' (Carter Center, Atlanta, 2005), pp. 43–57.

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The UK doesn't have a supreme court that can strike down primary laws; its courts can only issue rulings of inconsistency under the "Human Rights Act 1998." [1285] The constitutional safeguarding of the right to vote in UK elections is taken from "common law; the European Convention on Human Rights as enacted by the Human Rights Act 1998 (Art. 3 of Protocol 1 guarantees the right to free elections)"[1286] and the parliamentary and political laws of electoral integrity that have been upheld, excluding some historical exceptions, since the "Ballot Act of '72."[1287] This constitutional framework has not been tested on electronic voting, as no electronic voting technology has been approved for UK parliamentary elections.

Electronic Voting Trials and the Electoral Commission's Conclusions

The United Kingdom's involvement with electronic voting has been limited to a series of local election trials performed in 2002 and 2003, done through approval issued by the Electoral Pilots' Order 2002. The pilots examined a number of electronic voting methods in thirty-eight local government regions in England and Wales. These included "touch-screen voting, telephone voting, digital television voting, and internet voting." The Electoral Commission evaluated these trials, releasing a thorough summary of their findings in 2003 and a more complete study in 2007.[1288]

The Electoral Commission's 2007 report on electronic voting came to the conclusion that it was not appropriate for United Kingdom elections at that time. [1289] The Commission recognized four primary concerns:

- the lack of a voter-verified paper audit trail in the tested DRE systems, which prevents verification of the electronic count
- the risk for failures in networked or internet-based voting systems
- the deficiencies of the security in the tested systems
- the absence of a legal framework for the implementation of electronic voting in national elections.

The Commission stated that additional research, development, and piloting are necessary before consideration of electronic voting for any UK elections and that any system must have a voter-verified paper record.

Electronic Enumeration and Its Constitutional Ramifications

The United Kingdom has not adopted electronic voting but has implemented electronic counting, where optical scanners decode paper ballots, especially in Scottish Parliament elections. [1290] The use of electronic counting has led to public debate and raised complaints to the parliamentary and health service ombudsman, pointing out the UK electorate's reaction to technological advancements in the counting procedure. The difference between electronic voting and electronic counting has major legal and constitutional importance, "one fully eliminates the paper ballot from the process, while the other maintains it as the official record." The UK's acceptance of electronic counting, with its dismissal of electronic voting, indicates a constitutional decision in line with the global stance that the paper ballot shall remain as the final record, while electronic technology can function as a supplementary tool in its tallying.[1291]

Venezuela: Electronic Voting with Institutional Control

Constitutional Structure and the National Electoral Council

"The Bolivarian Republic Constitution of Venezuela, adopted by a referendum in 1999,

[1285] Human Rights Act 1998, c. 42 (U.K.).
[1286] European Convention on Human Rights, Protocol No. 1, art. 3, Mar. 20, 1952, 213 U.N.T.S. 262.
[1287] Ballot Act 1872, c. 57 (U.K.).
[1288] Electoral Pilots' Order 2002, S.I. 2002/1037 (U.K.).
[1289] Electoral Commission, Electronic Voting: Findings and Recommendations, 2007 (U.K.).
[1290] *Electoral Commission, Report on the Scottish Parliament and Local Government Elections, 2007 (U.K.).*
[1291] *Parliamentary and Health Service Ombudsman, Complaints Relating to Electronic Counting in Elections, 2008 (U.K.).*

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identifies in Art. 293 the Consejo Nacional Electoral (National Electoral Council, or CNE) as the constitutionally designated entity responsible for supervising all elections and referenda." [1292]

Art. 294 establishes the principles that regulate the election system: transparency, impartiality, expediency, efficiency, and reliability. The principle of transparency has emerged as the primary topic of debate in Venezuelan parliamentary politics, with the opposition and international observers regularly disputing "whether the CNE's governance of the electronic voting system meets the requirements for transparency." [1293]

The constitutional framework of Venezuela establishes a five-member Board of Directors (Directorio) for the CNE, nominated by the National Assembly. "The CNE has been influenced by appointed members from the start of the Chavez administration, and its autonomy from the governing party has been constantly questioned by the opposition and outsiders." The lack of independence of the electoral authority from the ruling party is a drawback of Venezuela's voting system. separating it from the electoral frameworks of India, Brazil, Germany, and the United States, where electoral authorities possess a significant degree of constitutional or statutory independence.[1294]

The Automated Electoral System and Its Legal Framework

Venezuela implemented electronic voting for national elections in 1998, with machines provided by the Spanish company Indra Sistemas during the presidential election that resulted in Hugo Chávez's first election. The system was later enhanced with machines provided by Smartmatic International Corporation, a technology firm founded in Venezuela that became the principal supplier of Venezuela's automated electoral system (Sistema de Automatización Electoral, or SAE) in elections from 2004. "The rules for automated voting are set by the 2010 Ley Orgánica de Procesos Electorales (LOPRE), which specifies that a paper receipt must be given for each vote, these receipts must be kept for checking later, and a quick audit of selected machines must be done right after voting ends."[1295]

The technical design of the Venezuelan system includes biometric voter verification (fingerprint authentication at voting terminals), electronic transmission of results from polling stations to the CNE's central tabulation server, and cryptographic safeguarding of vote data during transmission and storage. The technological requirements of the Venezuelan automated electoral system are, at first glance, equivalent to and, in certain aspects, more advanced than EVMs. systems utilized in other democracies. The core issue with Venezuela's electronic voting system is not technical but institutional. A technically sufficient system, managed by an institutionally corrupted electoral body, makes the system have predetermined outcomes instead of validating voter input.[1296]

International Observation and the 2004 Referendum

The Carter Center's analysis of the August 2004 presidential recall referendum provided an internationally credible certification of Venezuela's computerized voting system. "The referendum, which Chávez won with roughly 59 percent of the vote, was challenged by the opposition on the basis that the Smartmatic machines had been manipulated." The Carter Center, in collaboration with the Organization of American States, performed an audit (hot audit) and found that the electronic count matches the paper record. The Carter Center's approval of the results as indicative of the Venezuelan electorates will marked worldwide

[1292] Constitución de la República Bolivariana de Venezuela [CRBV], Dec. 30, 1999, art. 293 (Ven.).
[1293] Constitución de la República Bolivariana de Venezuela [CRBV], Dec. 30, 1999, art. 294 (Ven.).
[1294] Organisation of American States, Permanent Council, 'Declaration on the Presidential Elections in Venezuela' (OAS, Washington DC, 31 July 2024).
[1295] Ley Orgánica de Procesos Electorales (LOPRE), Gaceta Oficial No. 39.483, 12 de agosto de 2010 (Venezuela), Arts. 159–175.
[1296] International IDEA, The Electoral Integrity in Venezuela Reports.

trust in Venezuela's computerized voting system.[1297]

The 2024 Presidential Election: Constitutional and Legal Crisis

The July 2024 Venezuelan presidential election increased tensions related to its electronic voting system. "The CNE announced Nicolás Maduro, who is the current president, secured the re-election with almost 51 percent of the vote, with such a narrow margin. The opposition led by Edmundo González questioned the outcome, claiming that tallies indicated González's victory with almost 67 percent of the votes." The CNE refused to release the machine-level vote counts required by the LOPRE, making it difficult to check the computerized results. This refusal went against the basic principle of transparency stated in Art. 294 of the Venezuelan Constitution. [1298]

Smartmatic distanced itself from the 2024 election, saying that it had no role in the Venezuelan electoral system since 2017.[1299] "The OAS Council passed a resolution to disclose the machine-level counts." The United States, the European Union, and other Latin American states refused to acknowledge Maduro's re-election as a valid outcome of a free and fair electoral process. The 2024 Venezuelan election crisis shows that electronic voting technology, no matter how advanced, can't guarantee the integrity of elections on its own. For any voting system to be legitimate, it must be unbiased, open, and follow principles of electoral justice. [1300]

The Global Normative Framework and Domestic Constitutional Standards

The study on the United States, Brazil, Germany, the United Kingdom, and Venezuelan electoral systems reveals that no "unified framework for electronic voting has received global approval." A global standard has emerged, laid out by the "Council of Europe's Recommendation Rec (2004)11, the OSCE/ODIHR Handbook, and the Venice Commission's Code of Good Practice." The report asserts that the integrity of any electronic voting system depends on its adherence to five fundamental principles: verifiability (results can be independently verified), transparency (the process is understandable to the general public), auditability (an independent paper trail exists for examination), security (the system is immune to tampering), and institutional independence (the electoral authority managing the system operates autonomously). Systems that meet all five standards have usually passed tests, and those that fail have been rejected, reformed, or discredited. [1301]

The German Federal Constitutional Court (BVerfG) established the highest standard of citizen verifiability without technological assistance and "invalidated Direct Recording Electronic (DRE) voting systems that did not provide an independently verifiable paper trail." The United States has arrived at a similar conclusion using legislative action, mandating a voter-verifiable paper record in forty-three states. Brazil has kept DRE voting with the incorporation of a VVPAT-like paper receipt mechanism into the Urna Eletrônica since 2002. Venezuela has shown that technical proficiency and documentation are not enough to ensure integrity; the absence of institutional independence is a major defect to the election body. The United Kingdom has put off approval for electronic voting until it develops solutions that meet its standards for verifiability and security.

Nations that have Prohibited EVM

After Germany and the Netherlands, numerous other countries have dismissed electronic

[1297] Carter Center, 'Observing Venezuela's Presidential Recall Referendum: August 2004' (Carter Center, Atlanta, 2005), pp. 43–57.
[1298] Ley Orgánica de Procesos Electorales (LOPRE), Gaceta Oficial No. 5.928 Extraordinario, Aug. 12, 2009 (Ven.).
[1299] Smartmatic International Corporation, Press Release, 'Smartmatic Statement on the 2024 Venezuelan Presidential Election' (30 July 2024).
[1300] Organization of American States [OAS], Resolution on the Venezuelan Presidential Elections, OAS Doc. CP/RES. 1234 (2024).
[1301] United Nations Human Rights Committee, General Comment No. 25, 'The Right to Participate in Public Affairs, Voting Rights and the Right of Equal Access to Public Service' (UN Doc. CCPR/C/21/Rev.1/Add.7, 12 July 1996), para. 20:

voting or opted not to implement it. [1302] In 2008, Finland conducted electronic voting trials in "three municipalities but abandoned the system after a considerable number of votes were lost due to machine failure".[1303] Norway executed internet "voting trials in 2011 and 2013 but canceled the scheme following a security assessment that found the dangers of violating vote privacy and system manipulation." [1304] France attempted to set up "internet voting for migrant citizens during parliamentary elections from 2012 to 2017 but discontinued the procedure in 2017 due to cybersecurity issues." [1305] Canada has utilized "paper ballots for federal elections, relying on electronic technology only for counting,"[1306] Australia utilizes "paper ballots for the House of Representatives, and the Senate is applying optical scanning for counting in certain states." [1307] Japan, South Korea, and most Western European democracies, except Estonia, have either dismissed electronic voting or restricted it to limited test programs. Estonia has been using internet voting since 2005.[1308]

The Indian EVM-VVPAT System in a Comparative Constitutional Context

The comparison of India's EVM-VVPAT system with international frameworks in five countries reveals a mixed but favorable assessment. "In terms of security and institutional autonomy, the Indian system is advanced, the air-gapped, OTP-programmed EVM is more resistant to remote manipulation than any other system, and the ECI is regulated under Article 324 of the Constitution, reinforced by Supreme Court rulings, and has a level of institutional independence from the current government."

For verifiability, the VVPAT slip offers a voter-verifiable paper record for each vote cast, but it does not utilize the audit potential of the VVPAT because of mandatory verification of only the 'five randomly selected polling stations' threshold. The Indian system does not entirely satisfy the German standard of citizen verifiability, as a voter cannot independently confirm that their EVM vote corresponds with their VVPAT slip, except through the restricted post-poll verification process. The confidentiality of the Indian system's source code is absolute compared to Brazilian and German practices of permitting access to source code for examination by political parties and security researchers. The Supreme Court ruling in N Chandrababu Naidu deemed the system constitutionally valid. The court's reasoning assigns priority to institutional control and technical audit over citizen-level verifiability, showing a constitutional norm that is less strict than the German standard yet more resilient than the Venezuelan institutional framework.[1309]

Conclusion

The worldwide referendum on the adoption and rejection of EVMs validates multiple arguments of constitutional importance. The credibility of electronic voting relies not solely on technical knowledge but on commitment to constitutional values of verifiability, openness, auditability, security, and institutional autonomy. The lack of a voter-verified paper record is the primary constitutional flaw in rejected or criticized EVM systems, as shown in Germany's ruling, the United States' withdrawal from paperless electronic voting, and Ireland's removal of its EVM system. The Venezuelan case shows that the electoral authority needs to be independent. The global standards established by the Council of Europe, the OSCE, and the Venice Commission serve as a model for evaluating EVM systems, with consideration of

[1302] Kiesraad (Electoral Council of the Netherlands), 'Report on the Withdrawal of Electronic Voting Machines' (Kiesraad, The Hague, 2008), pp. 7–14.
[1303] Finnish Ministry of Justice, Report on the Electronic Voting Pilot in Municipal Elections, 2009 (Fin.).
[1304] Norwegian Ministry of Local Government and Regional Development, Evaluation of E-Voting Trials, 2014 (Nor.).
[1305] French Ministry of Foreign Affairs, Report on Internet Voting for French Citizens Abroad, 2017 (Fr.).
[1306] Elections Canada, Voting Methods in Federal Elections, 2020 (Can.).
[1307] Australian Electoral Commission, Senate Counting and Use of Optical Scanning, 2022 (Austl.).
[1308] International IDEA, Electoral System Design Database, 2023.
[1309] Electoral Commission of India, 'Comparative Study of Electronic Voting Systems in Selected Countries' (ECI, New Delhi, 2014), pp. 5–35.

the traditions and historical contexts of each jurisdiction.

The EVM-VVPAT system in India, reviewed within this comparative framework, maintains a reputable standing, as it meets the international standard in all five dimensions. The issues concerning the sufficiency of the five-station VVPAT verification sample threshold, the availability of source code for independent examination, and the feasibility of the system's framework despite advancing computing technology are not exclusive to India; they are common to all jurisdictions that have implemented electronic voting. Their decision will evaluate if India's electronic voting system remains in line with the advancing global criteria for free and fair elections in the digital era.

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