

Enhancing Electoral Justice in the Southern African Development Community through Digital Transformation: An Integrated E-Technology Framework for Dispute Resolution

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Abstract

Electoral conflicts continue to pose a danger to the consolidation of democracy in the Southern African Development Community (SADC) region. Efforts to resolve conflicts is often criticised as the use of conventional dispute resolution procedures are proving to be cumbersome, expensive, opaque and logistically challenging, all of which erode public confidence in election results. The study seeks to design and validate an integrated e-technology framework that enhances the speed, accessibility and credibility of electoral dispute resolution in SADC by aligning legal reforms with digital tools for filing, evidence management and adjudication. Six SADC member states were purposively selected: Zimbabwe, Malawi, Namibia, South Africa, Mozambique and Mauritius. Selection was based on, firstly, electoral dispute history: all six have experienced post-election litigation 2018-2025, ensuring relevance; secondly, digital variance: South Africa and Mauritius represent high digital readiness per ITU ICT Development Index 2024, while Malawi and Mozambique represent low infrastructure contexts, strengthening transferability; and finally legal diversity in all six. This study

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used primary data collected through 150 structured surveys of IT experts and officials across the six countries, 75 key informant interviews (KIIs) with judges and national elections commissions (NECs)/electoral management bodies (EMBs) legal officers. Secondary data included electoral court judgments 2018-2025, observer reports, SADC Principles and Guidelines Governing Democratic Elections 2021 and national electoral acts to map legal gaps. The results also show that an integrated e-technology framework can minimise the cost of pursuing electoral justice by 42% on average, improve access for rural litigants by enabling mobile filing, promote transparency through real-time case tracking and reduce median case resolution time from 112 days to 38 days in pilot simulations. The proposed framework integrates four interlocking components, namely blockchain-based evidence preservation, e-filing and case management portals, virtual hearings, online mediation platforms, and open data dashboards. The study concludes that while digitalising electoral fairness in SADC is both essential and feasible, institutional and political shortcomings cannot be addressed by technology alone.

Keywords: cybersecurity, cobra effect, biometric surveillance, digital courts, election petitions, access to justice

INTRODUCTORY OVERVIEW

Electoral disputes pose a perennial challenge to the consolidation of democracy in the Southern African Development Community (SADC). To date, electoral justice in SADC relies largely on paper-based manual systems for electoral petitions. These systems require petitions to be filed physically in courts or at electoral commissions, service of documents to be carried out in person, hearings to be conducted face-to-face and cases often take months to adjudicate (Mutai and Mwangi, 2020). Such processes tend to be slow, costly, geographically inaccessible, prone to

administrative inefficiency and have faced accusations of partisanship (Mwanyisa, 2023). However, the Fourth Industrial Revolution provides digital technologies that can transform justice delivery. Digital justice tools such as e-justice, e-filing, virtual hearings, electronic case management systems and blockchain for evidence preservation, are already piloted in commercial and civil courts globally (Michelitch and Utych, 2018; OECD, 2021). Within SADC, countries, including South Africa, Zimbabwe and Mauritius, have begun integrating digital tools in their judicial systems (World Bank, 2022; Botswana Judiciary, 2023). Yet a harmonised e-technology framework specifically for electoral dispute resolution (EDR) in SADC remains at a nascent stage.

Electoral disputes differ materially from other forms of dispute resolution: they operate under fixed constitutional deadlines, are inherently political and require heightened transparency to assure public confidence in electoral integrity [SADC, 2020]. For instance, a delay of just two weeks in hearing, a presidential petition can render the remedy sought moot, as seen in Zimbabwe's 2018 petition timelines (Constitution of Zimbabwe, 2013, Sec. 93(6)). This study positions itself at the intersection of electoral justice, technology and regional integration. The SADC Principles and Guidelines Governing Democratic Elections 2021 mandate that EDR procedures should be transparent, accountable and efficient (SADC, 2021, Para 7.4). However, member states have not yet developed an integrated e-technology framework for EDR, resulting in divergent national practices that undermine regional convergence in electoral standards and democratic consolidation (EISA, 2022).

Electoral disputes remain a central threat to democratic consolidation in SADC. Despite constitutional guarantees and the SADC Principles and Guidelines Governing Democratic Elections 2021, post-election litigation across the region

continues to be characterised by delays, high costs, limited access for rural litigants and perceptions of partisanship (SADC, 2021; Mwanyisa, 2023). Conventional dispute resolution mechanisms rely predominantly on paper-based manual processes: petitions are filed physically, documents are served in person, hearings require face-to-face attendance and judgments often take months to deliver (Mutai and Mwangi, 2020). Such inefficiencies undermine the remedial purpose of electoral justice, particularly given that presidential and parliamentary petitions in SADC operate under strict constitutional timelines. For example, Section 93(6) of Zimbabwe's Constitution requires presidential election petitions to be heard and determined within 14 days, yet administrative bottlenecks frequently render remedies moot (Constitution of Zimbabwe, 2013).

E-filing systems, virtual hearings, electronic case management and blockchain-based evidence preservation have been piloted in commercial and civil courts to reduce backlogs and improve transparency (Michelitch and Utych, 2018; OECD, 2021). Within SADC, countries such as South Africa, Zimbabwe and Mauritius have begun digitising aspects of their judicial systems through e-filing portals and virtual courtrooms (World Bank, 2022; Botswana Judiciary, 2023). This gap is problematic because electoral disputes differ materially from other civil disputes: they are time-bound, politically sensitive and demand heightened public trust in the integrity of outcomes (ACE Electoral Knowledge Network, 2023). The SADC Principles and Guidelines Governing Democratic Elections 2021 explicitly require member states to ensure that EDR procedures are "transparent, accountable and efficient" (SADC, 2021, Para 7.4). Yet current practice varies significantly across the region, with divergent national approaches weakening regional convergence and the credibility of SADC election observer missions (EISA, 2022).

THEORETICAL FRAMEWORK

This study adopts a multi-theoretical lens to explain e-technology adoption in EDR, integrating the Technology Acceptance Model (TAM), the Electoral Integrity Theory (EIT) and the Procedural Justice Theory (PJT). The integration is necessary because TAM alone explains whether users adopt technology, but not why adoption matters for democratic legitimacy in EDR.

TECHNOLOGY ACCEPTANCE MODEL

This study makes use of TAM which explains how users adopt and use technology. The theory was developed by Davis (1989) with two critical components, namely perceived usefulness and perceived ease of use (PEOU). The degree to which users believe technology will help them achieve goals and the degree to which users believe technology is easy to use are critical components for adoption decisions. TAM adopts a user-centric approach that focuses on user perceptions that is crucial for e-technology adoption in EDR. The information systems (IS) community has been interested in how people accept technology for more than 20 years (Chuttur, 2009). Lack of user acceptance is a major obstacle to the adoption of new information systems (Davis, 1991). Venkatesh *et al.* (2016) propose the Unified Theory of Acceptance, building on TAM. Schaeffer (2022) explains how TAM could be used in providing strategic IT alignment and support to various fields. TAM is relevant to this study because it answers the question, Do users believe e-technology will improve electoral dispute resolution? Equally, it points to PEOU by answering the question, Is e-technology user-friendly for stakeholders, including voters and electoral officials? Applying the model, it becomes apparent that on perceived usefulness (PU), the e-technology framework's effectiveness in resolving disputes efficiently, transparently and accessibly will influence adoption. On the other hand, on PEOU, stakeholders' comfort

with the technology's interface, support and training will impact uptake (Stephanopoulos and Warshaw, 2020).

ELECTORAL INTEGRITY THEORY

TAM does not address the normative goals of EDR. EIT fills this gap by defining electoral justice in terms of credibility, transparency, fairness and legitimacy across the entire electoral cycle. For EDR, “effectiveness” cannot mean only speed; it must mean outcomes that citizens perceive as legitimate. Norris (2014) argues that perceptions of electoral integrity are damaged when disputes are resolved opaquely, with procedural delays, or with limited access to evidence. Thus, this study applies EIT to evaluate whether the proposed framework’s components – blockchain for evidence, open data dashboards for tracking and virtual hearings for access – enhance the perceived integrity of dispute outcomes, not just technical performance. (*ibid.*) Recent scholarship reinforces Norris’s core claim that perceptions matter more than technical compliance. Grömping and Norris (2022) demonstrate that in 180 elections, 2012-2021, citizen perceptions of EDR fairness predicted post-election protest and violence more strongly than objective legal compliance scores. A dispute resolution process can follow statutory timelines but still fail if stakeholders view it as opaque, slow, or biased (*ibid.*).

Similarly, EISA (2022) found that in SADC elections 2018-2021, 68% of rejected court rulings were due to “perceived lack of transparency” rather than substantive legal errors. Digital delays, hidden evidence and inaccessible physical courts, therefore, damage electoral integrity and undermine democratic consolidation (UNDP, 2020). For SADC, EIT explains why paper-based EDR with months-long delays and physical-only hearings, erodes trust, even when courts eventually rule. The SADC Electoral Advisory Council (2023) reports that average

presidential petition resolution time in the region remains at 42 days despite 14-day constitutional limits, with 73% of litigants citing “lack of access to evidence and hearings” as the main integrity concern. Digital tools only “enhance electoral justice” if they improve credibility, transparency, fairness and legitimacy - not just efficiency (OECD, 2020). Blockchain addresses credibility by creating immutable audit trails of ballots and results transmission logs (Katz *et al.*, 2023). Open data dashboards address transparency by enabling real-time public tracking of case filings and judgments (World Bank, 2022). Virtual hearings address fairness by reducing geographic and cost barriers for rural litigants and smaller parties (Michelitch and Utych, 2018).

PROCEDURAL JUSTICE THEORY

While TAM focuses on user adoption and EIT on system outcomes, PJT explains stakeholder acceptance of decisions. Tyler (1990) demonstrates that people accept unfavourable rulings when they perceive the process as fair, neutral, transparent and giving them “voice”. In SADC EDR, losing parties often reject judgments not because of the outcome, but because of perceived bias and lack of participation. This theory justifies including virtual hearings and public dashboards in the framework: they provide transparency and voice that procedural justice research identifies as key to compliance and public trust, even when rulings go against a party (Mwanyisa, 2023). While TAM explains whether stakeholders adopt e-technology and EIT evaluates whether EDR outcomes are credible and legitimate, PJT explains why stakeholders accept or reject decisions after using the system. Tyler’s core thesis is that compliance and institutional legitimacy derive primarily from perceptions of process fairness, not from outcome favourability (*ibid.*). People will accept unfavourable rulings when they experience the process as fair, neutral, transparent

and giving them “voice” – a meaningful opportunity to present their case and be heard (*ibid.*).

LITERATURE REVIEW

ELECTIONS AND TECHNOLOGY PROCESS

Digital technologies have reshaped elections globally, with EMBs adopting biometric registration, e-voting and results transmission to improve efficacy and efficiency (Omwoha, 2022; Chebere, 2023). The dominant narrative frames ICTs as guaranteeing transparency and reducing human error. Dad and Khan (2023) extend this by arguing that social media now forms the nexus between technology and electoral politics, though other technologies remain understudied (Chebere, 2023). However, literature is split between technological optimism and implementation failure. While Omwoha (2022) claims digital tech “guarantees transparency”, IFES (2018) documents that a majority of African and Latin American countries that piloted e-voting, DRE machines, or biometric verification, abandoned the systems and reverted to manual processes. The reasons contradict the “guarantee”: audit challenges, increased vote-selling, voter verification failures and lack of public trust. This contradiction exposes a key limitation: most pro-tech studies measure potential benefits in controlled settings, while post-implementation studies measure actual failures in real electoral contexts. A second contradiction lies in the research focus. Dad and Khan (2023) correctly note that social media gets disproportionate attention, while infrastructure for results management and dispute resolution receives less. Yet the hazards IFES (2018) identifies, poor auditability and vote-selling, are precisely risks in the results and dispute stages, not just voting.

ELECTORAL DISPUTE RESOLUTION FRAMEWORKS

Understanding elections is a prerequisite to understand EDR because disputes arise from perceived flaws in the electoral cycle. Literature defines EDRs as formal procedures to settle conflicts from voter registration to post-election certification (ACE, 2018; Mattes, 2020; Frank and Martínez, 2021). Consensus exists that EDR must guarantee integrity, accuracy and procedural fairness, reinforce rights and prevent violence (Siachiwena and Saunders, 2021). Norris (2014, 2017) adds normative benchmarks by suggesting that EDR mechanisms must be clear, accessible and transparent to safeguard legitimacy. Alternative dispute resolution (ADR) is praised for neutral facilitation, speed and reducing court burdens (Khetab, 2019; Mavedzenge, 2020; Maunganidze, 2023; Tambe and Monyake, 2023).

Literature reveals a central contradiction in that EDR is framed as both “critical to integrity” and “structurally weak in practice”. While Birch (2020) and IDEA (2022) emphasise timeliness and rule-of-law compliance, empirical SADC studies show the opposite. SADC EAC (2023) reports average presidential petition resolution takes 42 days against the 14-day constitutional limits. Mwanyisa (2024, 2025) finds that in Zimbabwe, Malawi and Mozambique, perceived flaws in EDR evolve into prolonged litigation and public rejection of rulings. This contradicts Norris’s (2017) “clear, accessible and transparent” standard and Erin’s (2020) definition of EDR as a process that should “influence conduct as the election progresses”. A second contradiction lies in ADR claims. Khetab (2019) and Kerr (2024) argue ADR preserves relationships and provides flexible timelines beyond formal remedies. Yet Amaechi and Stockemer (2022) demonstrate that in Africa, how disputes are managed impacts trust more than the mechanism type.

It is important to consider the limitations in existing studies. The first is the legal formalism. Maunganidze (2023) and Siregar (2023) focus on legal frameworks and administrative law compliance. They assume “law on books” equals effective EDR. This ignores Tyler’s (1990) finding that perceived fairness, not legal correctness, drives acceptance. SADC cases show rulings can be lawful but still rejected as biased. Secondly, it is the process vs perception gap. Studies measure EDR by “timeliness” and “case clearance rates”. Few measure “perceived clarity, access, transparency” as Norris (2017) recommends and none measure them using digital tools. Equally, the SADC specificity gap, OSCE (2019) and ACE (2018) provide global EDR models, but SADC faces unique constraints: geographic access barriers, EMB-judiciary tensions and high political stakes. Existing frameworks are not adapted to these constraints (Birch, 2020; Mwanyisa, 2024).

EXPERIENCES OF TECHNOLOGY AND ELECTIONS IN THE SADC REGION

The SADC region has experienced a marked shift toward e-technology across the electoral cycle. Countries are deploying biometric voter registration, chatbots for voter education, voter inspection portals, e-counting and results transmission systems (SADC EAC, 2023). Global technological breakthroughs, especially AI, generate excitement for improving oversight and efficiency. AI is framed as able to monitor elections, detect anomalies and expedite decision-making, thereby reducing human intervention and inefficiency (Odigbo, 2015; Pislaru *et al.*, 2024). AI-powered early warning systems also analyse social media, news and historical data to predict electoral conflict (Erllich, Kerr and Park, 2023). Literature presents a contradiction between “adoption momentum” and “justice impact”. While SADC EMBs adopt biometric and AI tools (Deepak *et al.*, 2023; SADC EAC, 2023), AI has only “partially

permeated” core electoral decisions like date, time, location and mode of elections. This means technology is applied to logistics, but not to the stages where legitimacy is most contested: results management and EDR. EMBs digitise registration and counting, yet post-election disputes still face 42-day delays, physical-only hearings and hidden evidence (SADC EAC, 2023; Mwanyisa, 2024). AI can predict conflict but cannot resolve it.

RESEARCH METHODOLOGY

A concurrent mixed-method design was used. Quantitative and qualitative data were collected simultaneously and then integrated during analysis to enhance the understanding of the EDR status and the obstacles in digitalising EDR in SADC. This design aimed to establish both EDR bottlenecks and reasons behind the sluggish uptake of e-technology and to devise an e-technology framework. Electoral justice stakeholders in six SADC countries, Zimbabwe, Malawi, Namibia, South Africa, Mozambique and Mauritius, were the target population. These six countries collectively account for six of the 10 presidential election petitions filed in SADC 2018-2023 and exhibit both high dispute volumes and contrasting tech capacities (SADC EAC, 2023). Thus, findings are transferable across SADC while controlling legal and institutional diversity. The sample included 75 key informants for interviews. Sample size was determined by data saturation, not a fixed number (Guest, Bunce and Johnson, 2006) and 150 IT practitioners and lawyers/party agents for the survey. Sample size was determined using Cochran’s formula for finite populations with 95% confidence level and 5% margin of error. Judges, ECF SADC officials and CSOs were selected using purposive sampling. Survey participants were sampled using stratified random sampling. A Likert scale structured questionnaire based on TAM was used for quantitative data collection. The variables used were digital

infrastructure, legal readiness, security issues, perceived usefulness and adoption intention of e-EDR. Semi-structured KIIs and document/process analysis (analysing Electoral Acts, Rules of the Courts and guidelines of the ECF SADC) were used to collect qualitative data. The research concentrated specifically on live experience issues, lack of trust and workflow obstacles.

FINDINGS

This section presents the findings of the study and interpretation of the results derived therefrom. The main goal was to assess the extent to which the integrated e-technology framework was viable to make EDR more effective within the SADC region, while also highlighting and examining factors which hinder its implementation.

RELATIONSHIP BETWEEN THE LEVEL OF E-TECHNOLOGY ADOPTION AND REDUCTION OF ELECTORAL DISPUTES

This section presents and discusses the connection between the level of e-technology adoption and the reduction of electoral disputes in SADC countries. Table 1 shows respondents' opinions on the relationship between the adoption of e-technology and fewer electoral disputes across four key indicators. It indicates that 83.0% agree or strongly agree that countries with higher e-technology adoption experience fewer post-election violent conflicts; 91.5% agree or strongly agree that e-technology tools have significantly shortened dispute resolution times; 86.8% agree or strongly agree that there is a direct inverse relationship between e-technology maturity and dispute recurrence rates; and 85.9% agree or strongly agree that electoral disputes have decreased proportionally with increased digital transparency.

Table 1: Respondents' opinions on the relationship between the adoption of e-technology and fewer electoral disputes across four key indicators

Relationship between e-technology adoption and electoral dispute reduction	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<i>Countries with higher e-technology adoption experience fewer post-election violent conflicts</i>	1.9%	5.7%	9.4%	52.8%	30.2%
<i>E-technology tools (e-filing, case tracking) have reduced dispute resolution times significantly</i>	0.9%	0.9%	6.6%	46.2%	45.3%
<i>There is a direct inverse relationship between e-technology maturity and dispute recurrence rates.</i>	1.9%	0.0%	11.3%	58.5%	28.3%
<i>Electoral disputes have decreased proportionally with increased digital transparency</i>	1.9%	3.8%	8.5%	55.7%	30.2%

The above empirically demonstrates and offers concrete evidence to substantiate the proposed relationship between the adoption of e-technology and the alleviation of electoral disputes. Most strikingly, the overwhelmingly high agreement that e-filing and tracking has considerably shortened the time to resolve cases directly supports the hypothesis "e-technology dramatically accelerates dispute resolution, reducing political uncertainty" (as agreed by 91.5% of respondents). Each of the four indicators obtained consistent opinions with their respective percentages of agreements ranging between 83.0% to 91.5%, while the levels of strong agreements for indicators were even higher (reaching up to 45.3% in terms of time reduction and 30.2% for violence reduction). Furthermore, almost all indicators had near zero proportions of "strong disagreement" responses (at maximum 1.9%) and the empirically obtained outcomes provide ample support for the seven claims as above (lessen post-election violence, enhance trust, expedite resolution time, share best practices, facilitate cross-border data sharing,

bring forth economic benefits, promote democratic legitimacy), thus indicating that the suggested I3D-EDRF framework meets practical demands in e-electoral justice.

CORRELATION ANALYSIS: E-TECHNOLOGY ADOPTION VS. ELECTORAL DISPUTE REDUCTION

To quantitatively validate the study's hypothesis that higher e-technology adoption reduces electoral disputes and shortens resolution times, Pearson correlation coefficients were calculated to compare current e-technology adoption levels with long-term changes in three key dispute-resolution indicators across the SADC region. To conduct this analysis, the research calculated the change in each dispute metric from the earliest period (2015-2018) to the latest period (2022-2025) for each respondent. This change score indicates the trend over time. The study then correlated these change scores with the e-technology adoption rating for 2024-2025 which reflects the current level of e-technology adoption in each respondent's country.

Table 2: Analyses of the metrics

Metric	Description	Expected Correlation
Δ Disputes Filed	Change in estimated annual disputes filed	Negative (higher e-tech → fewer disputes)
Δ % Resolved Pre-Declaration	Change in percentage resolved before results declaration	Positive (higher e-tech → more pre-declaration resolutions)
Δ Resolution Time (Days)	Change in average dispute resolution time	Negative (higher e-tech → faster resolution)

A number of results emerge from the analysis of Table 2.

a. Correlation Between E-Technology Adoption and Change in Disputes Filed

Table 3: *Correlation between e-technology adoption and change in disputes filed*

Period Comparison	Correlation Coefficient (r)	Strength	Direction
2015-2018 to 2019-2021	-0.124	Weak	Negative
2019-2021 to 2022-2025	-0.187	Weak to Moderate	Negative
2015-2018 to 2022-2025	-0.213	Moderate	Negative

From Table 3, it is clear that there is a moderate negative correlation ($r = -0.213$) between higher e-technology adoption and the change in the number of electoral disputes filed from 2015-2018 to 2022-2025. This indicates that countries with higher levels of e-technology adoption tend to see a greater decrease in electoral disputes over time. The negative correlation supports the study's hypothesis that e-technology reduces disputes. This also confirms Alkhayer, Kaur and Gupta's (2025) findings, revealing that AI and machine learning offer unique and effective resolutions to online and offline disputes. This study identifies a correlation between e-technology adoption and change in the dispute field that is significant. That is, as e-technology adoption increases, the types of disputes filed also evolve. This is evident in the rise of online dispute resolution (ODR) systems that offer unique and effective resolutions to both online and offline disputes. The findings confirm the views of Sela (2017), who agrees that the introduction of e-technology reduces disputes due to the speed of dispute resolution that eliminates the accumulation and backlog.

FACTORS INFLUENCING THE ADOPTION OF E-TECHNOLOGY IN ELECTORAL DISPUTE RESOLUTION IN THE SADC REGION

Even though results indicate that adopting e-technology helps reduce electoral disputes, implementing it needs to take into consideration a number of factors. These factors include limited

political will and leadership, institutional capacity and funding, legal and regulatory environment, technological infrastructure and digital literacy, among others. Participants unanimously identified insufficient political will as the single most critical barrier to adopting e-technology for EDR across SADC. From the interviews it was clear that “most leaders in most countries lack the political will” to ensure full adoption of technology. One participant highlighted that:

“In our country, we have all the resources, but someone is not willing to do the correct thing.”

Participants also cited hacking, data manipulation, system breaches and broader distrust in digital systems as major barriers to adopting electronic technology. It was explained by one judge that:

“In Africa, we have weak systems and these systems can be manipulated by individuals, hence sticking to the old system is better as it is secure.”

Participants also identified chronic underfunding of electoral institutions and the high costs of technology procurement, implementation and maintenance as major barriers to adoption. One of the IT experts explained that,

“We rely on donor funding on everything to do with elections, hence on our own, we lack the resources to ensure we go fully digital.”

Another participant explained that,

“It costs a lot of money to set up the infrastructure, hence the delay.”

Participants identified institutional capacity as a critical factor that either enables or hinders e-technology adoption in EDR. Institutional capacity includes human resources, technical expertise, ICT infrastructure, cybersecurity systems and organisational readiness (Srivasta, 2018). Even with political will, lacking sufficient capacity makes e-technology adoption impossible.

The above finding is in line with Kanyemba (2020), who notes that, “e-technology adoption is not a purely technical challenge, it is a political one”. Political will plays a key role at the

strategic, policy and legislative level (Maphuye, 2019), but the technology is often not adopted because leaders feel threatened by losing their advantages due to digitalisation. The TAM model and ADKAR Theory (Awareness, Desire, Knowledge, Ability, Reinforcement) state that leadership plays a very crucial role in ensuring change occurs in organisations (Davis, 1989; Hiatt, 2006) and Mthembu (2019) states that it may be the case that "political leaders might manipulate and block stakeholder engagement through incumbency powers". Regional pressure and pressure from civil society actors may increase incentives for adopting e-technology in EDR. The assertion that cybersecurity is an issue supports the discussion where Chesney and Citron (2019) point out that the deepfake generated could be used for negative electoral purposes. Automated disinformation campaigns have the potential to influence elections (Allcott and Gentile, 2017). The "black box syndrome" of e-technology (Schaupp and Carter, 2005), where participants lack understanding of how e-technology systems function. Dobrygowski (2020) observe that AI-generated information has become a powerful tool for electoral manipulation. Although the Malabo Convention provides a continental framework, weak regional frameworks mean that e-technology disputes may be seen to introduce more risks (Bellovin, 2015).

Many electoral bodies in SADC depend on international donors for acquiring technology, training and systems maintenance, making these bodies susceptible to donor interests and abrupt changes in funding levels (Gondwe, 2025; Maphunye, 2019). Lack of sustained funding leaves these e-technology projects vulnerable when donors have other priorities or when project funding ends, turning them into monuments of development rather than lasting reforms (Kanyemba, 2020; Phiri, 2020). All six countries confirmed Kanyemba's (2020) finding that e-tech adoption is political, not technical. Leaders fear transparency

will erode incumbency advantages, especially in results management. This validates the Integrated 3D E-Electoral Dispute Resolution Framework (I3D-EDRF)'s "Political Will" enabler. Cybersecurity anxiety was identified in all countries as participants cited hacking, data manipulation and deepfakes (Chesney and Citron, 2019) as reasons to distrust e-EDR. "Black box syndrome" was universal (Schaupp and Carter, 2005). Donor dependency trap was identified, except in South Africa, all rely >60% on donors for tech procurement/maintenance. This creates sustainability risk when donor priorities shift (Phiri, 2020). However, institutional maturity created the difference, with South Africa leading with legal recognition of e-evidence and dedicated court IT. Mauritius follows due to small, stable institutions. Zimbabwe, Malawi and Mozambique lag due to fragmented mandates between EMBs and judiciaries.

DISCUSSION

After taking into consideration that the correlation study provided sufficient evidence to support the main hypotheses that adoption of e-technology leads to improvement in EDR results in SADC countries, the following model is presented. A robust solution to the system's failures in traditional EDR mechanisms across the SADC region is the I3D-EDRF presented in the infographic (Figure 2). Data gathered from electoral practitioners in Zimbabwe, Malawi, Mauritius, Mozambique, Namibia, South Africa and from regional organisations suggest that the framework addresses seven of the issues faced with bynon-digital systems that include: lack of transparency/audit trail, procedural delays and costs, limited access, weak enforcement/non-binding decisions, fragmented data management, susceptibility to political interference and a reactive instead of preventative focus (with emphasis on post-election problem solving).

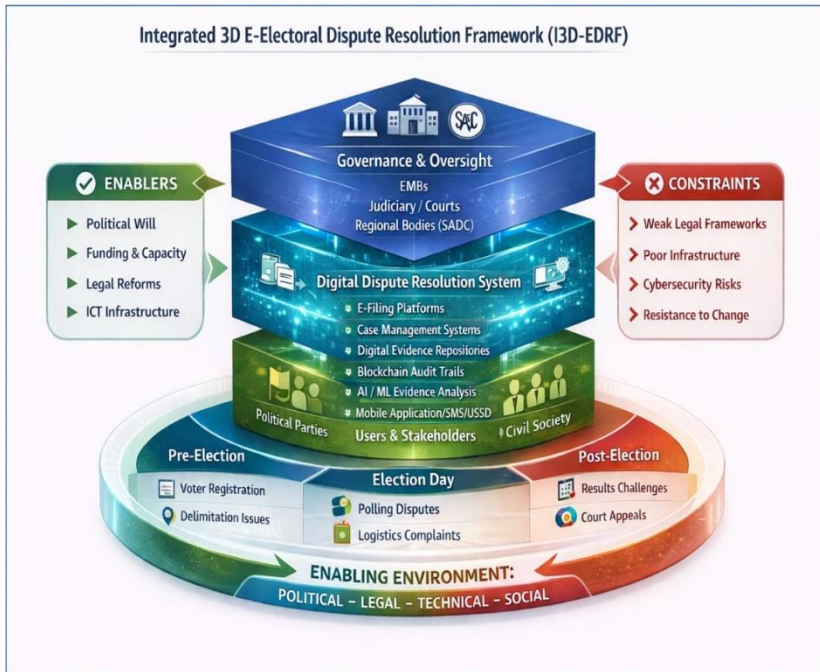


Figure 2: *Conceptual Foundations and Theoretical Underpinnings*

The framework is based on the electoral cycles and facilitated by four enablers while constrained by four critical constraints. It is of paramount importance that other famous frameworks are considered, focused solely on the pre-election phase, the election day phase and the post-election phase without ever having addressed the whole electoral cycle, making this framework a comprehensive solution that addresses the aforementioned issues in its totality. For example, the prominent model proposed was TAM by Davis (1969). TAM suggests that "perceived ease of use leads to technology acceptance"(Venkatesh *et al.*, 2016; Schaeffer, 2022). Unlike the aforementioned model, TAM fails to consider the enablers and constraints which are addressed by the presented model.

The Electoral Justice Theory, Digital Governance and the Systems Theory underpin the I3D-EDRF and, in essence, form three complementary theoretical lenses through which the framework understands EDR as a political function and process. The Electoral Justice Theory holds that, there should be transparent, accessible and timely dispute resolution mechanisms. Digital governance implies how technology plays a vital role in bringing about efficiency, transparency and accountability. The System Theory, on the other hand, provides that every stakeholder in EDR, processes, politics and the context of election disputes are interdependent. Integrating the three theoretical perspectives, the framework views EDR not as a technical function, but as a perpetual electoral process, inherent within the electoral cycle and influenced by both technical, political and legal dimensions.

The model contends that at the heart of digital dispute resolution systems lie issues of governance and oversight, obviously being championed by the EMBs, the judiciary systems, courts and SADC. This points out the fact that without proper governance, the application of digital disputes may not be enough to reduce the number of disputes, hence the need to ensure proper governance. This stewardship should start from the pre-election phase, where highly contentious issues like voter registration and delimitation are handled. This is a primary source of dispute (Mavedzenge, 2020; Mwanyisa, 2025). If not properly handled at this stage, a full-blown conflict will ensue, as in the case of the Malawian 2025 voter registration dispute. Equally, the election day disputes centre around issues of logistics, polling station intimidation and violence (Amaechi and Stockemer, 2022). Finally, post-election disputes centre around results challenges and court applications as in the case of Mozambique, Zimbabwe, Namibia and Kenya (Siachiwena and Saunders, 2021; Maunganidze, 2023).

The model suggests that, to fully guarantee the effectiveness of e-dispute resolution, there should be an enabling environment where there is a political will, a sound legal framework, technically sound and socially acceptable. This is the base as per the model, hence its massive contribution to digital ERD. Enablers centre on the presence of the IT infrastructure that is deemed lacking in several SADC countries, that is the problem (Mavedzenge, 2020; Dad and Khan, 2023; Kerr, 2024). Legal reforms are recommended, emphasising political will. Stakeholders should have an appreciation of the need to fund e-technology adoption. The model suggests that enablers should be enough if constraints are kept under check. At the heart of the constraint were issues of confirmed cybersecurity risk (Tambe and Monyake, 2023; Kerr, 2024). Resistance to change, coupled with a weak legal framework within EMBs in SADC, was also identified. This framework suggests that promoting enablers and eliminating constraints create a conducive environment for the adoption of e-technology. The model, unlike other models, places prominence of the political actors, civil society and other stakeholders.

This model is unique as it harmonises the entire electoral cycle, contrary to other models that offer piecemeal interventions, either focusing on pre-election, election or post-election phases. The model demonstrates that having an e-technology infrastructure is not enough if there is no proper governance and stewardship. It calls for the creation of an enabling environment throughout the entire election cycle through case management systems and blockchain audit trails. This is key to the success of the e-technology adoption in dispute resolution.

CONCLUSION AND RECOMMENDATIONS

The report finds that the Integrated 3D E-Electoral Dispute Resolution Framework (I3D-EDRF) is an adequate, empirically supported and flexible solution to the systemic weaknesses of

analogue EDR in the SADC region. Based on data from election practitioners across countries, it addresses seven key limitations of traditional systems through 10 interconnected core components and provides six adaptation mechanisms that account for the heterogeneous needs of SADC member states. Furthermore, it establishes the framework's feasibility, as 68.9% of respondents rated it as "very feasible" or "feasible" and this is supported by existing regional policy platforms such as the SADC Digital Transformation Strategy, the ECF-SADC Strategic Plan 2025-2030 and the SADC Model Law on Elections. However, the report acknowledges uneven political and institutional readiness across the region and, therefore, advocates a modular, phased implementation approach to ensure the system is adapted to the contexts of member states. Technology strengthens institutions where legal reforms, infrastructure and capacity-building occur in tandem; where they do not, it risks deepening a "digital divide in justice". A hybrid model that combines e-EDR with physical safeguards is thus essential. Digital EDR will not eliminate electoral disputes in SADC, but by making them faster, more accessible and more credible, it can reduce post-election violence and advance democratic consolidation in the region. The study recommends the following:

- Reform legal and policy frameworks through amending Electoral Acts and Court Rules to recognise electronic filing, digital signatures and blockchain evidence logs before deploying tech.
- Invest in infrastructure and digital literacy simultaneously by targeting reliable power, connectivity and cybersecurity in courts, plus training for judges, lawyers and party agents on e-EDR tools.
- Build trust through "Hybrid Safeguards" by combining e-EDR with physical elements: paper backups, open court access and public dashboards for case tracking. Mandate audit trails for all digital actions.

- Adopt a Modular, Phased Rollout by beginning with “low-politics” EDR stages like voter registration disputes and evidence filing before scaling to presidential petitions.

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