A Cost-Benefit Analysis of Electronic Voting Operations and Capabilities in sub-Saharan Africa

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Abstract

This paper evaluates critical issues facing democratization, voting process, election outcomes, and the quality of governance in sub-Saharan Africa since independence. It further explores the future prospects of democracy and political development in the context of 21st century global political conditions and realities. The study specifically provides a cost-benefit analysis of technology/electronic voting operations and capabilities in conducting elections in the countries of sub-Saharan Africa. Finally, it recommends strategies for achieving political development, leadership accountability, responsible governance, and sustainable democracies in Africa.

Introduction

Over the past several decades, there have been recurrent political issues and problems of enormous proportions in the attempt to establish democratic governance in many countries in Africa, especially in the sub-Saharan region with varying degrees of leadership corruption and abuse. Research conducted by scholars across academic disciplines investigated the persistent issue of government instability, poor electoral process, and lack of transparency in voting operations. Citizens, stakeholders, and the global community have expressed dismay about the failure of democratic practice in Africa as well as the poor quality of elections. Discussing Africa and the challenges of democracy and good governance in the 21st century, Adejumobi (2000) noted that democracy in Africa requires efficient and honest governance in financial management and in the animation of civil society and its democratic values, readjustment in economic policy and political agenda. The author further noted that many years of political instability, lack of governmental accountability and transparency, the presence of military dictators left a good number of African countries "politically demobilized and economically decapacitated," placing the countries in global economic and political competitive disadvantage.

Over the past four decades, the World Bank and other democratic-oriented institutions have maintained that government's ability to enhance participation in the democratic process is central to the success of elections in Africa and in other parts of the world. A crucial challenge facing nascent democracies in Africa is to ensure effective participation and engagement by a majority of the citizens in the democratization process. As Coates and Pitroda stated in (Adesina, 2001), ICTs are the most potent democratizing tool ever used for electoral success and in ensuring democratic accountability. Additionally, an unimpeded access of citizens to information technology is the strongest support for political equality that the world has ever seen since the beginning of the industrial era. The author further stressed that the fundamental feature of a well- functioning and responsible countries the world over, including Africa, is democracy, which is largely instrumental to healthy civil engagement and political development.

More than two decades ago, The World Bank (1994) identified Africa's political development problems as fundamentally a problem driven by unaccountability and disingenuous leadership, which essentially is the inability to use political power to manage a nation's political and economic affairs. As emphasized in Adejumobi (2000), the struggle for democratization, political accountability, and credible leadership is critical not only in liberalizing political as well as achieving political liberties, but also in ensuring political commitment and stability for African citizens. A number of studies (Gymah-Boadi, 2004; Diamond, 2004; Okoro, 2010; & Nwaokeafor, 2013) agreed that there was a connection among poor political governance, political instability, and under-development in sub-Saharan Africa.

Furthermore, The World Bank (1989, p. 60) cited in Adejumobi (2000) explained that because countervailing power was lacking in African States, governmental officials in the countries were selfish, disingenuous, consistently serving their own interests without fear of reprimand or punishment. Regrettably, political leaders and elected officials have built up private and personal networks of influence rather than make state governments accountable for their systemic failure.

Political corruption expanded in African states to an alarming proportion with politics personalized, and patronage has become essential to maintaining political power and influence. Leadership in most countries in sub-Saharan Africa exercises broad and untold discretionary authority, thereby compromising legitimacy and integrity of the political system.

Political Mis-Governance and Democratic shortcomings

Studies of recent years have characterized Africa's political development as replete with administrative failures, shortsightedness, and myopic leadership patterns. Acknowledging Ki—Zerbo, 1996; Chabal, 1992; Amin, 1990; Rodney, 1972, Adejumobi (2000) emphasized that corrupt governance is predominant and endemic in sub-Saharan Africa ranging from parliamentary, military dictatorships, to one-party style of political administration. The author identified two specific elements that were instrumental to Africa's misgovernment. First is that African nations inherited misrule and corruption from their colonial administrators; and the second factor is that political arrangements, social orientation, and economic values practiced and promoted in the colonial era were not appropriate and conducive for adoption in Africa's post-colonial development phase.

Although Africa's early objectives focused on national integration, tribal and ethnic unity, and democratic development, the dominant practice demonstrated "dictatorship of development rather than democracy of development."Adejumobi and other political researchers determined that civil and political development would remain far-fetched and constrained in sub-Saharan Africa. Independently, these researchers determined that to establish and promote a credible and transparent government in Africa would entail four complementary factors: Expanding and strengthening civil and political entities and engaging or utilizing democratic potentials; demilitarization and demobilization, re-orientation of economic policy, and reevaluating and redefining the international context of democracy in Africa through reformation of the global economic and political order.Indeed, the failure of several democratic experiments in Africa, particularly in the sub-Saharan region has consistently occurred as a result of political apathy, misfeasance, misgiving, and a lack of commitment by citizens.

The demand for political interest and involvement of citizens in the choice of their leaders and decision-making process, which constitutes the critical focus of political democracy (Sorensen, 1993) is a required prerequisite for sustainable democratization to be achieved in Africa (Adejumobi, 2000).Further, The World Bank (1994) contends that the strategy of structural or economic adjustment cannot reclaim Africa from her poverty-stricken environment. African leaders should complement institutional and capacity-building with credible governance, because the primary factors underscoring Africa's development constraints is the crisis of irresponsible and discreditable government.

Technology Integration in Elections: Promoting Accountable Governance

The capacity to elect credible leaders in Africa will certainly be the beginning to achieving sustainable democratic development. Understandably, the current election processes and democratic standards in Africa have attracted a range of negative analysis and criticisms. The attempt to democratize many countries in Africa has been unsuccessful because of the methods in which people were elected and the manner in which elections were conducted. A review of political elections in Africa in the past two decades leaves much desired, because many citizens have lost confidence in the nature of democratic rule, and a good number of citizens have not been participating because voting operations were risky and they lack transparency.

The quality of progress in Africa's political system has been exceedingly poor and utterly deplorable as a result of numerous challenges facing political governance in many countries. The World Bank's Sustainable Development Report on Africa (2008 p. 14) noted that democratic process in the continent is extremely fragile and untenable, and it emphasized that "the emerging structures of governance- political parties, elected institutions of the legislature and the executive, remain weak and not adequately institutionalized."

The report further noted that in many African states, the lack of independence from executive branch of government has grossly minimized or even compromised the effectiveness of watchdogs and advocacy role in conducting functions, duties, and responsibilities associated with democratic governance.

In order to realistically engender and institutionalize democracy, political development, and responsible governance in sub-Saharan Africa, four major independent factors should be considered and consistently emphasized: the strengthening of civil society and unleashing and actualizing its democratic potentials, demilitarization and demobilization, the re-orientation of economic and political policy, and reconstructing and transforming the international context of democracy in Africa, by modifying economic and political system (The World Bank, 1994; Adejumobi, 1996).

Political Development and Democratic Reform in Sub-Saharan Africa

Recent studies clearly indicate that auspicious institutional renewal and the need for democratization have preoccupied much of the development agenda in countries of sub-Saharan Africa. Diamond (2004) described the democratic struggles in the continent as a surge in despair over political and economic prospects towards the end of the 20th century and at the beginning of the twenty-first century, which strongly called into question the quality of political reforms and development initiatives. While national commitment and the desire for democratic politics have remained a priority in African countries for decades, the outcome of political elections has been totally controversial, inefficient, dysfunctional, questionable, and grossly unacceptable.

For this and other practical reasons, an important aspect of democratic reform in Africa should the ability to organize and conduct a respectable voting process, which will allow the election of responsible and credible national political leaders with a high sense of integrity and credibility. Unfortunately, several attempts at enforcing effective and efficient measures of oversight for political governance has been in vain because of deep-seated corruption, which appears seemingly inherent in Africa's political system. Independent political experts and analysts have recommended technology integration in elections in Africa to sustain human efforts at democratization. Expert opinions and political studies indicate that an important first step in fostering and strengthening democratic reforms is transforming the voting process in the countries of Africa in order to ensure inclusiveness, transparency, accountability, and integrity. Evidently, the obsolete methods of casting votes and electing political leaders in Africa over the years have contributed largely and significantly to the disturbing levels of corruption, intimidation, and violence which have besieged Africa's political systems.

As Gymimoah-Boadi (2004) explained in a brilliant assessment of democratic reform and political development in Africa, democratization and political progress in the continent encountered stiff and discouraging shortcomings, setbacks, and unprecedented deficiencies as a result of deep-rooted corruption, administrative selfishness, and political mismanagement. The inherent self-serving motives of elected officials could only be curbed if sophisticated election process is introduced and institutionalized in order that credible leaders can be duly elected to run the affairs of African countries. Essentially, the establishment and sustainment of democracy must begin with fair and free elections in which citizens would be interested in participating in electioneering campaigns and subsequently vote for credible candidates based on their track records. Political reforms must ensure that the process of electing people is credible and that election result is acceptable without coercion and intimidation or threats. Studies indicate that election process with integrity would allow citizens to participate fully. Indeed, the continuing disenchantment of African citizens with the deplorable democratic patterns in African countries is the result of poor elections, apathy, and questionable election results.

Political scholars and authors contend that democratization and political development are two sides of the same coin. Therefore, it is almost impossible to achieve a credible democratic system, let alone sustainable democratic government, without an election process in which a majority of the citizens can actively participated in campaigns and voting. As discussed in ACE project (1998-2015), several countries have evaluated advantages and disadvantages of Internet voting capability as an avenue to enhance voter interest and participation. Of much importance to African citizens and voters is the assurance of voting/election process integrity and reliability in order to make election outcome acceptable. It stands to reason that the current method of electing political leaders in African countries using ballot and voting papers must be replaced with electronic voting technologies which has the capacity and methodology to enhance the quality of elections, elect candidates based on merit, and provide acceptable elections outcome. More than two decades ago, an international conference was held in Ota, Nigeria, which was focused on "democracy and governance in Africa."

It was unanimously recommended that political leaders in Africa recognize the significance and value of change for the common interest and benefit of African countries and their citizens so that a lasting positive impact could be established for leadership change in the continent as well as the improvement of economic and human conditions. The former Nigerian Head of State Obasanjo and his associates (1991) stressed that political change should include the acceptance of the "redefinition of the concept of development providing for the full integration of the economic and human dimensions" for the betterment of the global society. Globalization calls for consistency and uniformity in governance, living standards and conditions, as well as in political systems. For various important reasons; democratization in Africa is a necessary condition for acceptable political development and global recognition.

The Advent of Electronic Voting Technology

The introduction of electronic voting system is a significant process essential for the improvement of the outcome of elections and for the reduction of fraud and corruption associated with ballot boxes and ballot papers. Another important factor in elections is gaining public confidence, which electronic voting is designed to establish. Research has shown that over decades, African citizens have questioned the outcome of election results because of dishonesty in the process – dishonesty that was often engendered by skillful manipulation of ballot boxes and ballot papers to favor specific candidates. Specifically, studies by Diamond 2004 and Gyimah-Boadei (2004) indicate that many countries around the world have embarked on technological development of adopting electronic voting technologies to improve election outcomes. Garson (2006) added that the term electronic democracy (e-democracy) is a collective concept involving democratic activities ranging from campaigns, elections, to election results. Electronic voting technology was designed and expected to enhance the efficiency, effectiveness, and applicability of democratic process of electing qualified candidates to serve their countries.

The electronic capability improves democratic engagement by creating an effective plat form for informing and engaging citizens in the political process. Macintosh (2006) explains that a valid election is one in which citizens participated freely and fairly to vote and select their representatives. Electronic voting system provides the much needed freedom, convenience, and confidence to vote without fear of harassment and intimidation, which were associated with updated manual voting system.

The introduction and supervision of electronic technologies is not a simple replacement of the updated ballot boxes and ballot papers with electronic equipment. The entire management and oversight of elections with electronic voting system is fundamentally different from elections with the traditional ballot papers. The new process requires total restructuring and reorganizing of the electoral sequence and its aspects to ensure adequate accountability. Furthermore, decisions to establish electronic voting mechanism should be carefully and thoughtfully evaluated with an expanded involvement and commitment of major national stakeholders, in light of a number of critical factors that will ensure success of the new system. The decision to introduce the electronic voting must be fully explained to the citizenry in order to respect the rights and interests of voters, citizens, and political candidates (Organization for Security and Cooperation, Europe Office for Democratic Institutions and Human Rights, 2003).

Researchers Achieng and Ruhode (2013) noted the widespread of electronic voting in many parts of the world with commendable results. In their analysis of the adoption and implementation of electronic voting technologies, they noted that electronic voting and counting processes were successfully utilized in India, Brazil, Belgium, and South Africa, and the Philippines. They added that the adoption of electronic voting was introduced in Philippines because of widespread election fraud which characterized the country's national elections. In the sub-Saharan region, electronic voting technology was suggested and implemented in Nigeria and Ghana because of similar election fraud and mishandling. Democratic elections were conducted in Nigeria in recent years and the results were challenged and questioned across the country, because the process was discredited and unacceptable.

According to Ahmad and his associates (2015), the elections in Nigeria caused a lot of discomfort to citizens as a result of complaints and problems, such as missing names of some registered voters, intimidation and disfranchisement of voters, multiple and under-aged voting, snatching or destruction of ballot boxes, miscomputation and falsification of results. Alemika (2015) emphasized that manual electoral system (ballot boxes and voting papers) created national disaster in the form violence, conflict, disruption, which diminished public trust and confidence in political governance in the country, causing intense division and disgruntlement.

According to Nwagu (2011), Ogbuadu (2012), and LeVan & Uka (2013) several dishonest and greedy African politicians exploited the weaknesses and vulnerabilities of the obsolete traditional voting system of the traditional paper ballot method to perpetuate huge electoral fraud in their countries, killings of innocent citizens, and burning of voting locations to conceal election evidence. These incidents necessitated the exploration of electronic voting capability to ensure transparency, accountability, and safety during elections. Additionally, the sophistication of the electronic voting technologies in African elections is expected to restore electoral dignity, voter confidence, and encourage more voter participation. For example, in the wake of numerous complaints, concerns, and discouragement in election results, the government of the Nigeria established the Independent National Electoral Commission (INEC) and charged it with the responsibility of introducing and implementing transition to electronic voting in the country. I n support of electronic voting capability, Jega & Hillier (2012) noted that both developed and developing nations of the world are adopting and using electronic the technology for credible and accountable election results.

Electronic Voting Technology and Democratization

Independent of each other, political scientists and communication scholars Diamond, (2004), Gyimah-Boadi, (2004), Okoro, (2010), Nwokeafor, (2013) emphasized the value of information and communication network in campaigns, voting process, and election outcomes. Specifically, Nwokeafor (1992) and Okoro (1993) in their numerous studies on agenda-setting paradigm explained the significance of raising the awareness of citizens and providing relevant information for the benefit of making informed and conscious decisions and choices in political election. Political communication is equally crucial in elections and it is instrumental to creating the knowledge base of the voting public. Voting and elections are two critical processes in democratization and political communication, and citizens deserve a fair opportunity to express their opinions and choices by casting votes without intimidation, harassment, or coercion.

Indeed, to ensure voter confidence and participation, security, ease of use, process efficiency, and accountability should be an integral part of voting and election methods. For instance, Ananda and colleagues (2012) cited the 2000 national election in the United States involving the famous "butterfly ballot" episode in Palm Beach, Florida, which caused a national controversy about ballot design, inconsistency of election rules, voter error, and allegations of fraud. The authors stressed this particular election malpractice, mishandling, and fraud because the incident engendered "a dramatic wave for new laws to be implemented in the United States," and the incident also called for a review and evaluation of manual and electronic systems of voting in the country. It was well noted by international organizations involved in elections that technology is advancing and playing a crucial role in a variety of settings, including voting and elections. They encouraged the introduction and use of electronic voting systems (International Peace Institute, 2011; Freedom in World 2010).

Several studies conducted after many election failures around the world validated the seemingly indispensable function of information and communication technology in both developed and developed countries. As societies are changing and growing more sophisticated in their institutional processes and methods, information technology is gaining more recognition and continues to play a central role in system improvement to cope with the challenges of globalization and modernization. Given the global nature of the world, the political environment of countries in Africa should improve their voting process in order to contribute to world economic development. As Tita and Gyimah (2010 p.5) concluded in their analysis of electronic voting in sub-Saharan Africa,"stable political atmosphere would imply a rapid and high economic growth, while an unstable political atmosphere would imply a low and slow economic growth."

Therefore, there is a strong correlation between political stability of a country and its economic growth; in other words, a politically stable country will attract global investments. Tadayoshi (2003) (cited in Ayo & Ekong, 2008) explained the importance elections in democratic movement because citizens will have the opportunity make a significant decision regarding the choice leadership. For this reason, political elections should be conducted in an atmosphere that guarantees a fair and free process as well as ensures efficient, credible, and cost-effective to the citizens and nations, which ultimately makes election outcomes acceptable and credible.

Since gaining independence in the decades of fifties and sixties, many countries in the sub-Saharan Africa conducted their national and local elections manually using paper and ballot boxes, which were susceptible to manipulation and abuse by disingenuous electoral officers. Some of them received monetary values for falsifying election records and results.

According to African Elections Database (2007), manually conducted and supervised elections in many sub-Saharan African countries produced questionable and unacceptable results because of the inefficiency and weakness of the voting system. As a result, this chapter is intended to explore the usefulness of the electronic voting trend, provide costs-benefits analysis of the methodology, and identify recommendations for its future use to minimize or avoid citizens' disgruntlement and disillusionment with democratic elections. Evidently, the outdated voting method has created disappointing experiences in many countries with the sad result that voters no longer believe election results, and extremist voters who were impacted negatively by election outcome have discontinued voting entirely. Because of negative and discouraging criticism of the outdated voting methods, some countries have transformed their electoral process, upgrading it with the electronic voting technology and the outcome of their recent election results were satisfactory to a good number of voters. As noted in ACE Electoral Knowledge Network (2010), both developed and developing nations (India, France, Australia, the United States, Canada, Switzerland, Brazil, Japan, etc.) have successfully established and utilized electronic voting technology.

Recent elections of countries in sub-Saharan Africa (Nigeria, Kenya, Ghana, and South Africa, etc.) have reconsidered their voting methods and are now embarking on using the sophisticated electronic technology to ensure credible election outcome. E-voting Database (2010) indicates that electronic voting operation makes the counting of votes much easier, provides faster and convenient election participation, and attracts more voter engagement. Interestingly, the system is considerably cost-effective to use as well as increasingly reliable. The obsolete traditional method of voting in Africa involved casting votes into sealed or covered boxes, which were subsequently counted and reported by electoral officers. African Elections Database (2007) found this method extremely cumbersome, unreliable, and replete with a surge of irregularities. This method of voting, according to election experts, was known to compromise democratic values, especially by falsifying results and intimidating voters at the polls.

Furthermore, Indian Elections (2009) cited in Tita and Gyimah (2010) pointed out that electronic voting machine (EVM) was introduced to save time and labor and to reduce problems and conflicts associated with election outcomes in recent years, especially in the contexts of developing world where many political candidates demonstrated extreme desperation and viciousness during campaigns and elections. A significant aspect of electronic voting mechanism (Indian Elections, 2009) is its ability to maintain voting secrecy, and it has been described as "100 percent tamper proof with a touch of a button on the screen, the polling election results was made available."Additionally, voters were provided with simple and clear instructions that are usually printed in bold characters to guide the voting process and for faster decision-making. For faster operations, the voting equipment is equipped with two inter-linked units with a ballot unit for voters and a control unit for the polling officers at the station to function simultaneously.

The electronic voting system is operationally well-designed and equipped to be user-friendly, and an average voter spends a few minutes to cast his or her vote without any confusion and misinterpretations. The Indian Elections (2009) explained that the ballot box and ballot unit in the electronic voting equipment provide similar function for casting votes. This ballot unit is quite simple to perform and it displays the list of candidates contesting in the elections, and it has an inbuilt mechanism specifically built to incorporate party identification and symbols. Within the voting time-frame, voters are required to push just one button on the panel which identifies desirable candidates and their affiliations. Similarly, the control unit/section on the electronic voting system provides control of the polling which is exclusively used by electoral officers. This unit shows the total number of votes polled at any given time, indicates the time elections ended, and announces election results automatically. Election experts and the Indian Election Board (2009), described the electronic voting technology as highly sophisticated and functionally dependable, and that the system was remarkable for its independence, reliability, and validity. Moreover, the electronic voting technology is designed and built with "super-sensitive circuitry" that does not allow for invalid votes, irregularities, or vote duplications.

Path to Democracy and Development in Africa

For nearly a century, voting and elections in Africa have encountered numerous unprecedented challenges, diminution, and degradation around the world. While the opportunities for self-governance following decolonization of African continent, the freedom engendered euphoria in a good number of countries.

For many countries in the sub-Saharan region, their national independence appeared premature and under-estimated because of political instability, violence, and civil unrest that immediately preceded or accompanied their independence. As the International Peace Institute (2011 p.1) noted, "Violence and coercion became a common means of changing power. Coups, counter-coups, and aborted coups littered the political landscape on the African continent."However, there were a number of positive and exciting post-independence developments, democratic initiatives, and modifications with respect to democratization in Africa.

Interestingly, participatory political process developed in the decades of 1990s and 2010s, "as the percentage of African countries holding democratic elections increased from 7 to 40 percent" (Freedom House, 2010).As the struggle for democratic governance gained momentum within the past three decades, there has been increasing need for accountability, transparency, and credibility of political leaders "whose domestic legitimacy is largely linked to the means through which they attain and maintain power" (International Peace Institute, 20110).Enlightened and educated African citizens consistently clamored for democratic change and new political leaders to govern their countries, but little did they realize that the culture of their countries was not ready for change and self-rule.

In the wake of political independence, elections were held periodically which facilitated democratic governance in countries (Ghana, Nigeria, Senegal, South Africa, Mali, etc.)Unfortunately, the elections were manipulated to establish self-serving, autocratic political leaders with established "dynastic successions on the continent" over the years. Similarly, some countries in sub-Saharan Africa (Zimbabwe, Kenya, Nigeria, Ghana, etc.) encountered a recurrence and resurgence of electoral violence and manipulations, which impeded or frustrated democratization and political development over the years.

Electronic Voting Capability: A Cost-Benefit Analysis

As a result of decades of electoral failures, confusion, and violence in Africa caused by using the traditional ballot papers and boxes of voting method, election experts and international institutions recommended electronic voting as a viable and credible option for replacement. However, in order to ensure adequate utilization of this new technological device in Africa, this chapter provides a cost-benefit analysis to determine its effective and productive use and to substantiate the rationale for introducing this device. Expert opinions and empirical evidence strongly revealed that establishing electronic technologies for conducting elections is not a simple, basic replacement of the traditional ballot boxes and ballot papers.

Evidently, conducting and supervising elections with electronic voting device is fundamentally different from the process that was managed with paper ballot. The new electoral system requires a total restructuring and reorganizing of election and voting administration in significant ways, including establishing certification entities, vendors, voting/election administrators, and training in order to reap fully the benefit of the new voting operation.Research findings indicate that because of past election corruption and manipulation, building public confidence in electronic voting technology Africa is critically important and can be established over a period of observation time.

Cost of Using Electronic Voting Technologies

Because of the complicated nature of the electronic voting equipment, it was emphasized that electronic voting technology should be purchased ready-made and available for use in order that election authorities will not contract experts for extended training-related capacity to manage the system specifications. In some cases, there may be different specifications appropriate for a country's election and voting needs. Additionally, the logistics for the deployment and placement of voting equipment involve sensitivity than the distribution and deployment of ballot boxes at voting locations.

As the National Democratic Institute, the International Foundation for Electoral Systems, and USAID (2002, 2007) explained, electronic voting technologies need sufficient infrastructure and a dependable power source to perform efficiently. There should be adequate pooling stations and electoral officers for the equipment. Although some electronic voting equipment is built to operate with batteries, it is crucial to provide back-up batteries as recharging may be needed from time to time.

Significantly, storage of the voting equipment needs specially designated location with appropriately controlled climate and advanced security measures. Sufficient arrangements should be made for services, maintenance, and replacement of the voting system to ensure constant operational capability.

Although the equipment does not break down often, it is advisable to set-aside money for services, maintenance, and replacement as the durability of the electronic equipment is not indefinite and may depend on the type of equipment in light of rapid evolution of information technology in the twenty first century. Moreover, certification process for electronic voting equipment and software involve additional expense, because the operation should be performed by an independent organization and not by the vendor or election authority (USAID, 2007).

Electronic voting systems pose important and unique situation for election observers around the world: For example, how can staff/observers asses the workings of electronic systems? Why are the processes of vote counting and tabulation often invisible? What aspects of traditional observation remain relevant for electronic voting observation? What can and should be observed in the automated or electronic voting systems? What are the critical and essential access points in electronic voting process that observers need in order to assess the integrity of the voting exercise? Does electronic voting present new dynamics or challenges for the interrelationships between relevant stakeholders such as vendors, legislators, election officials and others? Are there unique legal or legislative implications for e-voting systems? (The Carter Center, 2007).The preceding questions and concerns are critical and were assessed in this chapter in order to make a valid determination regarding validity and reliability of the electronic voting capability in Africa, and to provide a broad cost-benefit analysis of the electronic voting device.

Voter education is another critical step in introducing and using electronic voting technology. Raising public/voter awareness, providing widespread information, guidelines, and instructions would require a substantial amount of spending and oversight. Clear guidelines about the use of the equipment should be provided and distributed in many forms to voters in advance of election period. According to International Foundation for Electoral Systems, a critical factor to the success of the electronic voting equipment is training of polling officials and availability of training manuals for staff and monitors to keep up with procedures and processes. Further, designated election supervisors should establish adequate and appropriate recruitment plans and staffing needs for daily voting operations. In order to re-establish and sustain public confidence in democracy, maintaining accountability and credibility in elections is important and should be emphasized at all times to election staff, monitors, and supervisors. Although technology upgrade or transformation for credible elections are desirable, numerous studies and reports indicate that the process of acquiring electronic voting technology is quite a daunting experience that require thoughtful planning and deliberation.

Benefits of Using Electronic Voting Technologies

Quite unlike the traditional voting system, there are many strengths and benefits associated with electronic voting device which makes it extremely unique and much more desirable, especially in developing nations with a high degree of election incidents. Several reports agree that the system allows for faster vote count and tabulation of results, which makes manipulation of election results extremely difficult as results are provided or announced on a timely fashion. In addition, election results are more accurate and valid as human errors and other attendant issues are reduced to the barest minimum. The International Institute for Democracy and Electoral Assistance (2011) concluded that electronic voting technology provides efficient management and reporting of complex and complicated electoral mechanism that usually involve extensive and painstaking process. Voter presence and participation have progressively increased around the world, especially with the availability of Internet voting system.

Additionally, electronic voting enhances and improves the presentation and analysis of complicated ballot papers and increases convenience for voters, which directly and indirectly encourages interest and participation. The International Peace Institute (2011) stated that another critical advantage of electronic voting is fraud prevention at polling stations and locations as well as during transmission, tabulation, and distribution of results by eliminating human involvement. There is increased accessibility of ballot papers via radio for blind voters, with Internet voting as well as for household voters, and other voters overseas.

Moreover, with the advent of electronic voting system there is a significant reduction or total elimination of spoilt ballot papers as the voting system has the capacity to warn about or detect invalid votes. Finally, there is a tremendous long-term cost-savings in poll staff time and energy, and reduction in costs for the production, distribution, and management of ballot papers.

Over the past twenty years, research findings consistently and unanimously demonstrated the usefulness of electronic voting technologies, and citizens and electoral experts support the utilization of the new system as it clearly supersedes the paper-based system used in most developing nations. Countries with disappointing experiences about the ballot paper method are gradually adopting the new technology, and voting have been producing both exciting and encouraging outcome to sustain democratic values. For example, the Philippines adopted an electronic counting solution to deal with problems and conflict associated with fraud during the counting, tabulation, and analysis of election results. However, factors that affected the use of electronic voting technologies in specific countries were caused by unique elements such as logistical, cultural, political, legal, etc. existing in those countries. Overall, the advantages, benefits, or usefulness of electronic voting technology in democratic elections greatly outweigh the disadvantages.

Conclusion

Empirical research evidence and institutional report findings combined to substantiate that there is an undisputable connection between democracy and political development, especially in developing countries of Africa. The World Bank (1998), Diamond (2004), Agbaje (2004) among others strongly contended that Africa has lagged behind economically and in sustaining democratic values and standards because it has failed to uphold political government over the years. Unfortunately, standards of democracy have remained below the accepted threshold around the world. An effort to promote sustainable democratic reform in Africa requires collective commitment and objective utilization of best practices, technological reforms, and recommended global strategies to guide development initiatives. Diamond (2004) summarized that elections are critically important to democracy, but sporadic elections in a country cannot account for sustainable political development. Time and patience are needed to establish effective, efficient, and credible electoral systems that can earn global recognition and commendation. Although recent political elections in some African countries were more competitive, responsible, and openly inclusive than those conducted under authoritarian or dictatorial African leaders, there is more work to be done to maintain democratic governments.

As Xenakis & Macintosh (2005) remarked, political development is the product of responsible democracy. Therefore, electronic voting should be designed to contribute significantly to enhance election process in Africa, which ultimately would improve the low voter turnout. It should be noteworthy that among the many advantages of electronic voting technology, fraud prevention, trust in the innovation, and security of the equipment have increased the adoption of the system. The findings of this chapter, based on analysis of qualitative and quantitative studies and reports, adequately indicate that electronic voting technology has unquestionable benefits over the manual voting system.

Indeed, the advantages associated with the electronic voting system can sustain voter confidence as it eliminates the corrupt practices inherent in the manual voting mechanism. The chapter strongly recommends continuing adoption of the electronic voting technology in Africa, especially in sub-Saharan region. If African countries can .leverage on the opportunities and benefits that electronic voting provides, elections should be more peaceful and acceptable, and political development will be within reach in the near future. The International Institute for Democracy and Electoral Assistance (2011) confirmed that electronic voting is a sophisticated tool for making the electoral process more efficient and effective and for increasing trust in the management and supervision of elections globally. If appropriately introduced and adequately supervised, electronic voting mechanism is capable of increasing the security of the ballot system, speed up the processing of providing results, and can make voting and elections much easier. All in all, democratization will thrive in Africa if political leaders are democratically elected according to voting and election standards, corruption and election fraud curbed, disingenuous candidates eliminated, and voters' confidence restored.

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