Assessment of Electoral Result Management through a Phone-Based Digital System: Case of Political Science Association University of Kabianga (PSAUOK), Kericho–Kenya.

Dr. Thomas Otieno Juma, PhD[1*], Mr. Shadrack Kitheka Ndunga[2]

[1, 2] Lecturer-Public Administration/ Tutorial Fellow–Human Rights

*Corresponding author: Dr. Thomas Otieno Juma, PhD

Lecturer-Public Administration/ Tutorial Fellow–Human Rights

Abstract

Electoral management has become a sensitive undertaking among states and other institutions, and it is done to determine good outcomes for enhanced governance. Student elections, like any other, require a result management threshold geared to building future democratic ideals through practices in the college micro-political environment. At the same time, it involves professionalism in following practices and nurturing the processes whose outcomes are satisfactory to the electoral/voter. Electoral result management should be one that can easily be monitored and verified by the stakeholders involved. Electoral result management has been a case of conflict in many larger jurisdictions. The applications of phone-based digital systems can save costs, time, and accuracy if the actors involved intend. Known Mobile phone voting offers numerous merits to users. Despite these attributes, voting via a mobile phone has challenges prone to many contemporary communications technologies of the 21st century. This study was carried out following the past successful three elections of PSAUOK. With the main objective; Electoral Result Management through a Phone-Based Digital System: Case of Political Science Association University of Kabianga (PSAUOK), Kericho–Kenya. It sought to examine how electoral result management can advance stable professional associations, and establishing the relationship between electoral results medium and outcomes. The study employed qualitative research, where a descriptive survey design was adopted to investigate the phenomenon under investigation. The study targeted different PSAUOK cohort constituency subsets (years 1-4), where a sample size of 38 respondents was drawn from the student population undertaking Public Administration and Human Rights courses. The desired information was obtained through data resulting from a questionnaire. Data processing and analysis was done using an Online Survey Monkey Tool (OSMT) from which the questionnaire was modeled and later administered using the generated link, and analysis was automatically attained real time. The study employed purposive sampling technique on; PSAUOK executives, electoral board members, PSAUOK members, and observers using a questionnaire. A probability mode of simple random technique of every 10 of N (380 PSAUOK membership) from whom slightly above 50% voted was applied to select respondents who participated in the study. The findings form the basis of conclusions and recommendations for inference and improving internal efficiencies of PSAUOK elections.

Keywords: *Electoral Management, Election Results, Results Management, Digital Voting, Phone-Based Voting, Election Systems, University of Kabianga, PSAUOK, etc*

I. Introduction and Background of the Study

In today's fast-paced digital news and social media environment, people want to get real-time results. The phrase *"it's not who votes that count, it is who counts the vote"*[1]. While agreeing with Stalin that it is not who votes that counts, this study underscores that the outcomes of electoral process is shaped by a number of competing processes better referred as electoral infrastructure (electoral model in use, medium of voting and results processing, technological support system, and the human resources). All these collectively emphasize why it is important to effectively manage electoral results.

An election is a democratic process in which people vote to choose a leader. The integrity of an electoral process is vital to ensure accuracy, resilience against fraudulent activities, and consistency. Elections are crucial for representative democracy as they facilitate power transfer and ratify people's will. Elections ensure openness and impartiality through a formal decision-making process. Without these components, results reliability becomes questionable, prompting efforts to improve election standards in various democratic systems, as stated by Suleiman, Gambo, and Izah, (2021)[2].

The significance of democracy is that it provides the public with the freedom to vote conveniently and securely. One of the key objectives of this system is mobile phone voting, which eliminates the need for polling booths or paper ballots and is a time- and cost-efficient option. It is essential to develop a reliable and efficient system that eliminates these threats while ensuring the anonymity of voters. Therefore, it is crucial to have a trustworthy and effective system to implement mobile phone voting successfully.

Election Results Management is an essential process for ensuring fair and trustworthy elections. It includes the precise and transparent gathering, tallying, authentication, and declaration of election results. A Results Management System (RMS) is a comprehensive framework that oversees the process of tallying, consolidating, examining, and disseminating votes, as stipulated by the United Nations.

The principles for election results management include transparency, verifiability, accuracy, secrecy of the ballot, consistency, integrity, and timeliness. Transparency ensures all stakeholders are informed, while verifiability allows easy access. Accuracy minimizes errors, maintains ballot secrecy, and applies rules equally to all voters and stakeholders. Integrity minimizes fraud risks, and timeliness ensures careful planning. The Commission's commitment to these principles ensures a fair and transparent election process (IEBC, 2016)[3]. The process may be divided into three stages: the capture and storage of election outcomes (1), the transmission of election outcomes (2), and processing and publication of election outcomes (3).

Therefore, a results management system (RMS) is a comprehensive approach to electoral system design that includes vote counting, aggregation, analysis, and publication. Cobos-Flores and McDermott (2015)[4] reveal that assessing the legitimacy of elections generally relies on pre-election activities, such as voting and vote counting. The election process is often divided into three parts: voter registration (1), candidate registration (2), and the voting process (3). These steps have been extensively debated and analyzed. An election is deemed credible when all three stages are accurately carried out and observed.

Today, ICT is a widespread phenomenon, making technology-based electoral procedures inevitable, as Suleiman, Gambo, and Izah (2021)[5] noted. However, there is concern that this might threaten democracy since completely computerized voting systems may lack reliability (Njoku et al, 2018)[6]. Conversely, ICT is crucial in global governance by facilitating reliable voting procedures. It creates trustworthy and unbiased elections, ensuring the integrity of the democratic process. The widespread use of technology in election processes is a testament to the importance of safe voting in any democratic system, making it a fundamental element. In today's digital era, voting technology, including voting machines and results transmission networks, has become crucial to global elections.

Voting system is a democratic mechanism used for collective decision-making, both in organizations for selecting committee members and in choosing candidates for various posts. Nevertheless, the progression of technology has increased the intricacy of the process, resulting in vulnerabilities such as the omission of votes, the occurrence of double voting, and the incorrect tallying of votes. Traditional or partially automated voting methods are tedious ineffective, and deficient in terms of security (Shahriar et al, 2020)[7]. The study state that Vote is a secure Android-based mobile voting system designed for various institutions and organizations during and after the COVID-19 pandemic. The usability and usefulness of the app were evaluated using the System Usability Scale (SUS).

Despite initial criticism, these technologies have proven effective in reducing electoral fraud and improving election outcomes, thus enhancing the legitimacy of elections by providing earlier and more comprehensive public access to results. Digital media is an efficient and focused instrument for cost-effectively addressing the voting population. In the 2017 elections, political parties and candidates were subject to government regulations on phone messaging (SMS) and social media communications. Although the identity of senders was a requirement, the main focus was combating hate speech and incitement of violence rather than addressing permission for data use (Mosero, 2022)[8].

Digital technology converts vocal sounds into binary code, then sent to a destination where another piece of equipment reconstructs the numbers back into the original signal. Digital phone systems use voice over internet protocol (VoIP) and transfer digital signals over cable or fiber optics for transmission. Digital systems include digital phones, routers, modems, and broadband internet (Equipment). They require less on-site equipment and automatic updates (Cost). It requires strong, consistent internet, cable, or fiber

---

[1] Joseph Stalin said some version of "It's not the people who vote that count, it's the people who count the votes. https://www.snopes.com/fact-check/stalin-vote-count-quote/
[2] Suleiman, Gambo, and Izah, (2021)
[3] IEBC, 2016

[4] Cobos-Flores and McDermott (2015)
[5] Ibid
[6] Njoku et al, 2018
[7] Shahriar et al, 2020
[8] Mosero, 2022

optics (Reliability). Further, it has numerous features when combined with unified communications (Features)[9].

Counting ballots at polling stations has historically protected against government manipulation by transporting boxes to remote count centers. With the proliferation of vote tallying, paper results forms became susceptible to manipulation. Manipulating forms en route to election offices emerged as a contentious issue.

Posting results forms outside the polling station, distributing duplicates to political party agents and citizen observers, and utilizing tamper-evident envelopes were all measures taken to enhance results management. Equivalents to paper-based integrity mechanisms, including encryption, access controls, system records, and integrity checks, have emerged with the advent of digital technology[10].The use of data in political campaigns and canvassing has brought attention to the significance of safeguarding privacy and establishing a clear, ethical, and legal framework for handling personal data in digital media.

In Africa, 27 countries, such as the Democratic Republic of Congo, Gambia, Ghana, Nigeria, and Somalia, have used electoral technology to enhance transparency and equity in their electoral processes. The Kenya Integrated Electoral Management System (KIEMS) employs biometric voting, electronic voting, and results transmission methods for conducting elections in Kenya. The Independent Electoral and Boundaries Commission (IEBC) must guarantee the safeguarding of election-related technology (Mosero, 2022)[11].

Kenya National Commission on Human right (KNCHR, 2022)[12] report that the democratic system has encountered several constraints throughout its electoral cycles, including procedural, institutional, and legislative challenges. Consequently, there has been a lack of public confidence in the electoral process and its results despite multiple efforts to enhance the system. Further, the Elections Management Body (EMB) in Kenya has the constitutional duty to ensure Kenyans' right to participate in electoral processes. Despite challenges in past elections, IEBC has made good strides, as seen during and after the 2022 elections. However, KNCHR reveal that voter education need to be effectively conducted to promote meaningful voter participation through targeted voter registration drives in Kenya (KNCHR, 2022).

Kenya implemented a multi-tiered results system (RMS) prior to the 2010 constitutional referendum. The Independent Electoral and Boundaries Commission (IEBC) used this method for by-elections and presidential and general elections in 2013.Further, Kenya adopted Elections Results Management (ERM) that is a highly regulated process, governed by Articles 35, 38, 81, 86, 88, and 138

of the Constitution of Kenya (COK, 2010). In specific, Section 14 of the Elections Laws (Amendment) Bill in 2016 provides guidelines for determining and declaring results, the transmission of Presidential results from polling stations to constituency and national tallying centers (IEBC, 2016)[13]. The Elections (General) Regulations, 2012 outline administrative procedures for counting, announcement, packaging, and transmission of results from polling stations to tallying centers.

The 2013 Election Results Management (ERM) revealed several lessons learned, including providing intensive training to electoral staff, engaging stakeholders, clarifying roles, re-engineering processes, and vetting service providers. The Commission must ensure network coverage reliability and political neutrality by continuously engaging with the telecommunication industry. Vetting of all service providers during elections is crucial. Legal reforms are needed to address gaps and capture results management processes in a single reference document for stakeholders' use. These lessons emphasize the importance of a smooth and efficient results management process (IEBC, 2016)[14].

According to Mosero (2022)[15], Kenya has been used technology in voter registration, verification, and results transmission, effectively dealing with problems from the past such as obsolete voter rolls. Nevertheless, this development has also brought attention to fresh issues around privacy, underscoring the need for enhanced information and communication technology in Kenya's voting system. However, technology deployment in Kenya's election results management (ERM) has been met with mixed reactions, especially in the Results Transmission System (RTS) due to the challenges experienced during the 2013 General Election. Hence, to enhance the effective electoral process, the Commission is adopting appropriate technology for results management and transmission, simplifying the process, and addressing the inadequate telecommunication network coverage in some geographical regions.

Omolo and Odhiambo (2018)[16] opine that election authorities may be compelled to provide access or exploit vulnerabilities into jeopardize the system's confidentiality, integrity, or availability Prior to the 2017 election in Kenya, an individual in the position of an IT manager was subjected to torture and then killed in order to get access to the passwords required for the sensitive databases of the Independent Electoral and Boundaries Commission (IEBC)[17].

In Kenya, according to Omwoha (2022)[18] the use of digital technology in elections is intended to boost administrative efficiency, decrease long-term expenses, and promote transparency. The ultimate goal is to improve citizen inclusion and general election reforms. Despite the successful voting exercise, stakeholders dismissed the 2017 General Election results, urging the Independent Electoral and Boundaries Commission (IEBC) to *"open the servers"* with witnesses to verify the ballot papers in the

---

[9] Scott Rigdon. (2023, April,19). Analog Phone Systems vs. Digital: Which Is the Right Choice? https://www.vonage.com/resources/articles/evolution-analog-business-phone-system-voip-systems/#:~:text=Digital%20phone%20systems%20employ%20two,via%20cable%20or%20fiber%20optics.

[10] USAID. (2022, October) Briefing Paper: Cybersecurity of Election Results Management Systems. https://www.usaid.gov/sites/default/files/202305/Briefing_paper_2_Election_Results_Management.pdf

[11] Ibid

[12] KNCHR, 2022

[13] IEBC, 2016

[14] Ibid

[15] Ibid

[16] Omolo and Odhiambo (2018)

[17] Omolo, K. and Odhiambo, O. (2018). Chris Msando killed over a password, says Raila Odinga. The Standard. https://www.standardmedia.co.ke/entertainment/local-news/2001251941/chris-msando-killed-over-a-passwordsays-raila-odinga-as-slain-iebc-ict-manager-is-buried/

[18] Omwoha (2022)

boxes, despite the voting process being smooth. Further, the IEBC failed to uphold people's rights during Kenya's transition to democracy, leading to the emergence of the Swahili expression *'Fungua server'* (Open the servers), highlights the flawed electoral process and the violence that ensued. The research underscores the need for clarification on the server and prioritizing electoral openness as a crucial democracy measure.

II.   Problem Statement

Mobile phone voting offers a cost-effective, secure, and user-friendly alternative to traditional paper ballots, which has been shown to boost voter turnout. Mobile phone provides a cutting-edge technological features like audio, video, web, and email, mobile phone users and networks can easily transmit and receive polling data, access candidate messaging, and even enjoy politically-inspired ringtones. Given their widespread usage, portability, and affordability, mobile phones have been suggested by scholars as a promising tool for modern voting, as noted by Ullah, Umar and ul Amin, (2013)[19]. Despite these attributes, voting via a mobile phone has challenges prone to many contemporary communications technologies of the 21st century. Mobile phones voting pose security threats, coercion, flouting of online registration procedures, lacking ballot secrecy, anonymity, and double voting among others. The successful implementation of phone based digital system can be imperative for results management paradigm. This study sought to explore the use of phone based digital system in PSAUOK elections, a practice that has improved over three years but a study lacuna in Kenya. The study forms the basis for discussions to inform future application of mobile phone in formal elections for core results management for free and fair elections in PSAUOK.

III.   Objectives

With the main objective; Electoral Result Management through a Phone-Based Digital System: Case of Political Science Association University of Kabianga (PSAUOK), Kericho–Kenya. The study had the following other objectives;

Specific Objectives

i)   To examine how electoral result management can advance stable professional associations.

ii)   To establish the Relationship Between Electoral Medium (Phone-Based Digital System) and Electoral Outcomes.

IV.   Literature Review

Electoral Result Management and Stable Professional Associations.

In the United States, according to Mattice (2019)[20] reveal that the development of professional education programs for election administrators necessitates an all-encompassing comprehension of administrative responsibilities and structures, in addition to approaches to adult education. As many officials lack formal education, it is essential to provide educational and networking opportunities in order to cultivate a more professional cohort.

A group of election officials deliberated in the late 1980s and early 1990s on the professionalization of their field through the

identification of the required level of expertise for different responsibilities. The duties above comprised voter registration, roll maintenance, equipment security, poll worker recruitment and training, vote tallying, and result officiating. Standards, codes of conduct, licensing requirements, and academic prerequisites were all in place for other professions to ensure that practitioners maintained their professional standing. The objective of this discourse was to enhance the professionalism and efficacy of election officials.

The discourse resulted in the formulation of academic prerequisites, benchmarks, tenets, and ethical guidelines for electoral officials, with a particular emphasis on their function as custodians of democracy in relation to county, state, and federal authorities, which necessitates an intricate repertoire of abilities.

This case concerns the establishment of the inaugural professional association and educational program for election administrators in the United States. Electoral systems are crucial for selecting representatives and ensuring a government that reflects the people's will, forming the foundation of democracy. They should be inclusive, allowing even the most disadvantaged individuals to influence government policy actively. Efficient administration requires all-encompassing, enduring, equitable, and autonomous institutions, including electoral management agencies, which uphold regulations and ensure impartiality while collaborating with political parties and people.

The presence of free and fair elections in Ghana, Mauritius, and South Africa has enhanced the effectiveness of democratic institutions and promoted both economic and political progress. (Olaniyan, Mapayi, and Adejumo, 2011)[21]. On the other hand, Liberia and Sierra Leone have successfully conducted elections, resulting in national reconciliation and the establishment of democratic governance, after prolonged periods of violence.

Nevertheless, elections in several African nations are marked by the manipulation of election regulations, bribery, electoral fraud, intimidation, and violence, leading to tragic outcomes and hostility (Baguma and Eilu, 2014)[22]. Consequently, flawed election crises, such as the ones seen in Kenya, Zimbabwe, Uganda, and Nigeria, often arise due to defective electoral processes, which subsequently trigger violence, casualties, and extensive damage to property. The polarisation of political discourse has led to a decrease in voter turnout in many emerging democracies, with Africa having the lowest turnout rate at 65%.

Pinckney, Butcher, and Braithwaite (2022)[23] assert that civil society organisations play a crucial role in facilitating successful transitions to democracy. These non-political organizations show a consistent affinity for democracy and possess robust mobilization systems that enhance accountability for emerging leaders. This increases the likelihood of advances towards democracy compared to movements that other organisations control. The ideas are supported by quantitative studies utilizing data from resistance movements in Africa between 1990 and 2015.

The Relationship between Phone-Based Digital Systems and Electoral Outcomes.

The relationship between PBDS and electoral outcomes was explored descriptively. The mobile voting technology provides a

---

[19] Ullah, Umar and ul Amin, (2013)

[20] Mattice (2019)

[21] Olaniyan, Mapayi, and Adejumo, 2011

[22] Baguma, and Eilu (2014)

[23] Pinckney, Butcher, and Braithwaite (2022)

safe and efficient method for voters to submit their ballots. This technique supplants conventional systems such as polling booths, punch cards, lever voting, and optical voting machines, which need a greater amount of time. The system has three sequential stages: online registration, casting votes, and displaying results over SMS (Selvarani et al, 2017)[24]. This technology enhances the efficiency of the voting process by allowing voters to cast their ballots remotely and at any time. Additionally, it guarantees that every vote is counted and maintains the confidentiality of each voter's choice. The system employs OTP (one-time password) for authentication and login, hence prohibiting voters from casting repeated votes. Additionally, this decreases the amount of paperwork and removes the need for manual counting (Selvarani et al, 2017)[25].

Larin (2020)[26] conducted a study in Russia that examined the significance of mobile voting in facilitating active electoral rights for people, especially those who do not live at their permanent residences. The study emphasizes the critical function of mobile voting in assuring their participation. This is especially pertinent considering the increase of non-resident votes in Russia.

The study highlights the importance of mobile voting in promoting active electoral rights for citizens, particularly those who do not reside at their permanent residences, and emphasizes its crucial role in ensuring their participation in Russia. This is particularly relevant given the rise in non-resident voters. Developing nations, specifically those recovering from conflict and transitioning to democracy, are employing Information and Communication Technologies (ICTs) to enhance the efficiency of the electoral process, specifically in the area of biometric voter registration. The objective is to establish accurate voter registers devoid of fraudulent entries, as observed in the Democratic Republic of Congo, Togo, Guinea Conakry, and Uganda (Baguma & Eilu, 2014)[27].

Despite its fragility as a state, Afghanistan (Anonymous, 2024)[28] is effectively using new media and technology such as mobile cellphones and the increasing use of the internet. Nevertheless, the International Electro-Technical Commission (IEC) has yet to adopt this approach owing to cost and environmental limitations, which impede its capacity to incorporate innovative technology. Despite multiple attempts to integrate computer-based information and communication technologies (ICTs) into election processes in various developing countries, significant reports of high failure rates persist. In contrast to technical and security considerations, social, cultural, and economic issues predominate as the main causes of failure.

Although online information has the potential to democratize participation, it may impose limitations on women and rural electors who have limited access to mobile phones and the internet. The influence of election integrity on public perceptions of the electoral system. Mauk (2022)[29] establish that experiencing electoral defeat results in heightened suspicion since those who support the losing side regard the voting system (medium) as unjust. Further, the influence of political defeat on confidence

depends upon the degree of election integrity. This novel viewpoint on election integrity provides a new and unique understanding of the electoral result management system in PSAUOK.

The role of the media in politics is pivotal, as it provides crucial information to voters, aiding them in making informed decisions. However, the question of whether the media can influence election results is debatable. While it is essential for the media to remain unbiased and impartial in its reporting, it cannot be denied that the media has the power to shape public opinion. As such, media outlets must deliver accurate, balanced, and unbiased news to support fair and democratic elections.

Mobile phones, which are more prevalent than the internet, provide extensive access to people during elections. These tools are used for voter registration, candidate education, election activity monitoring, fraud tracking, and fundraising. Young people, especially those who are the focus of voter registration initiatives, are at ease with using mobile devices, particularly text messaging (Baguma and Eiulu, 2015)[30].

Cell phones have provided citizen journalists with the ability to document and distribute events on a large scale. Nevertheless, it can also function as a potent instrument of manipulation, wherein governments, opposition factions, foreign actors, media organizations, and journalists themselves disseminate disinformation and hateful content.

Mobile phone text messaging enables users to transmit concise or brief material, issue a call for action, and provide references to more comprehensive content via the web or email. The affordability of mobile phone services in comparison to voice services is a significant contributing element to their widespread appeal since it enables more economical communication. In the Philippines, the rate for a phone call is $0.10 per minute, while the rate for a text message is $0.028. In Uganda, the cost of a one-minute phone call is $0.08, whilst the cost of sending a text message is $0.02[31].

SMS voting[32] is a trustworthy and dependable technique for transmitting votes using shortcodes, substituting conventional cellphone numbers. This system provides customers with price information and sends a confirmation SMS upon receiving their vote, offering a quick and fast process. Voters are certain that the integration of social media and mobile apps may be used as effective instruments for monitoring elections, even if the existing reach of mobile phone and SMS technologies is already extensive.

The campaign provides political ringtones for mobile devices, a concise code for rally registration, and instructs supporters to submit donations using phone or mobile money systems promptly. Additionally, it encourages the exchange of text messages, ringtones, and shortcodes among supporters in the electoral process. Mobile phones have the potential to greatly enhance voter awareness at a small expense through the use of SMS. Souktel in Egypt specifically focused on women and adolescents by delivering informative SMS notifications about voting and registration processes. Souktel[33] partnered with Al Jazeera in Libya to collect locals' opinions before the 2012 election, resulting in over 5,000 replies.

---

[24] Selvarani et al, 2017

[25] Ibid

[26] Larin (2020)

[27] Ibid

[28] Anonymous, 2024

[29] Mauk (2022)

---

[30] Ibid

[31] Ibid

[32] Ibid

[33] Souktel, Undated

In 2006[34], the Thai Election Commission sent reminders to 25 million mobile phone subscribers, urging them to participate in the voting process. A separate campaign recommended that voters carry a writing instrument and a sheet of paper to mark their votes and deter counterfeiting. The extensive use of text messaging in the Philippines for voter education played a vital role, with a staggering 1.39 billion messages sent daily. This achievement has earned the nation the prestigious moniker of 'the world's text messaging capital. Mobile phones provide a personalized means of communication for campaigns to reach voters directly, bypassing the need for mass media. Utilizing political ringtones, wallpapers, and SMS election updates is very successful method of campaigning. The Bharatiya Janata Party used mobile phone slogans during India's 2004 general elections to target urban voters who may have otherwise shown apathy.

Mobile phones have become a potent instrument for monitoring elections, especially in Sub-Saharan Africa, where internet access and literacy levels are limited. Project Rakeeb collaborated with Advanced Computer Systems Firm to monitor Egypt's first parliamentary elections after the revolution in 2011. They used mobile phones to transmit text messages containing their views to a central data center. The National Democratic Institute used mobile phone technology to enhance election monitoring, document human rights violations, bolster civil society, and promote the democratization of voting information in several countries like Indonesia, Palestine, Bahrain, Albania, Sierra Leone, Lebanon, and others. Souktel [35] collaborated with the Tunisian Bar Association in Tunisia to establish a hotline where residents may report instances of election fraud and vote anomalies. During Sierra Leone's 2007 general election, over 500 observers were stationed at voting locations to document any instances of anomalies or fraud by using mobile phones. Both domestic and international observers unanimously proclaimed the election devoid of any manipulation, characterized by impartiality, and marked by openness, establishing Sierra Leone as a model for other African nations to emulate.

During the 2005 parliamentary elections in Ethiopia, voters used their mobile phones to alert the CUD party when they suspected their votes were being unlawfully taken at polling places, thereby thwarting fraudulent activities. The Montenegrin Referendum on Independence in 2006 saw the first usage of mobile phones for extensive election monitoring. Zaghloul, Li and Ren (2021)[36] opine that a novel remote e-voting model for large-scale elections, involving two conflicting parties to ensure election integrity and accountability. Implemented on Internet of Things (IoT) devices like smartphones, the model is secure, preserving voter privacy through secure multiparty computations and using a block chain running smart contracts as a tamper-resistant bulletin board to store votes and prevent double voting. The security and privacy analysis demonstrates the model has a potential against threats and voter anonymity, while performance analysis and smartphone simulation results demonstrate its practicality for large-scale elections.

The mobile voting system can nullify repeated voting attempts, ensuring the integrity of the election process. This objective may be accomplished by guaranteeing that each person is granted the right to cast just one vote. A voter-verifiable paper audit trail would function as conclusive proof of an election, including crucial information such as the start and end of the elections, the identities of the voters, and more particulars. When there is a disagreement, the thumbprint that represents the votes of persons restricted to a certain phone may be compared to their previous votes to confirm their genuineness.

In Kenya, according to KNCHR, (2022)[37] reveal that media plays a crucial role in election preparation, keeping the public informed, presenting political agendas, and seeking votes. Social media has become a mainstream platform for fast and real-time communication of campaign and results messages. The IEBC partnered with key media outlets to distribute election messages to approximately 30 million Kenyans due to reduced electoral participation during the 2022 election period. They also utilized bulk SMS and other social media platforms to disseminate election and human rights messages.

V.   Methodology

The study employed qualitative research, where a descriptive survey design was adopted to investigate the phenomenon under investigation. The study targeted different PSAUOK cohort constituency subsets (years 1-4), where a sample size of 38 respondents was drawn from the student population undertaking Public Administration and Human Rights courses. The desired information was obtained through data resulting from the questionnaire. Data analysis was done using an Online Survey Monkey Tool (OSMT) from which the questionnaire was modeled and later administered using the generated link, and analysis was automatically attained real time. The study employed purposive sampling technique on; PSAUOK executives, electoral board members, PSAUOK members, and observers using a questionnaire. A probability mode of simple random technique of every 10 of N (380 PSAUOK membership) from whom slightly above 50% voted was applied to select respondents who participated in the study. The findings form the basis of conclusions and recommendations for inference and improving internal efficiencies of PSAUOK elections.

VI.   Findings and Discussions

In this study, we assessed the Management of Electoral Results through a Digital System: A Case Study of Political Science Association University of Kabianga (PSAUOK), Kericho, Kenya. The findings are presented in the subsequent segments. The study captured the course of study of the students and the results are displayed in Figure 1.

Figure 1: Course of Study

76% (29) Public Administration
24% (9) Human Rights
(38) Responses

---
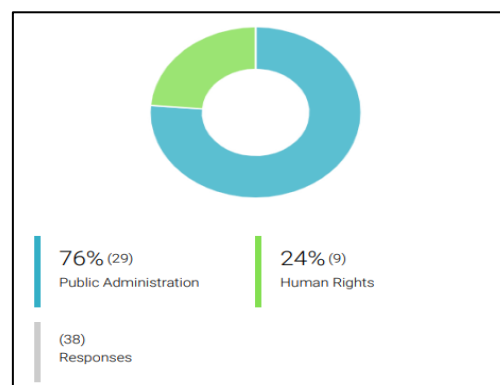
[34] Ibid

[35] Ibid

[36] Zaghloul, Li and Ren (2021)

[37] Ibid

Findings in Figure 1 demonstrate that a majority of students at PSAUOK (76%) study Public Administration, while 24% represent those from Human Rights who participated in the study. Both the courses play an essential role in nurturing good governance and professionalism on statecraft among the PSAUOK membership such as; democracy, reinforcing electoral processes, and contributing to transformative societal development.

**Figure 2: An Analysis of Gender of Voters in PSAUOK**
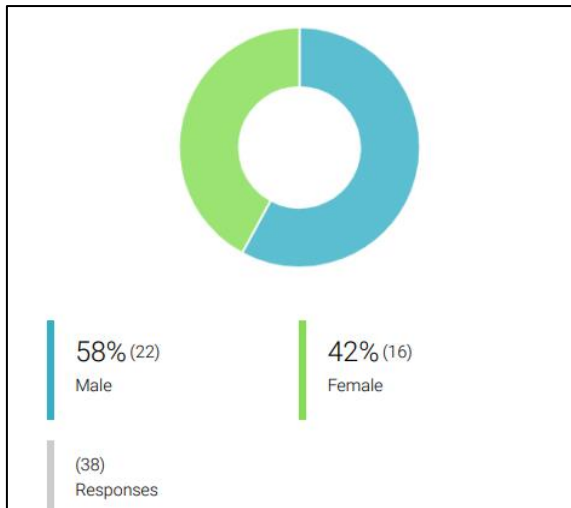
The data in Figure 2 depict that a majority of voters in the 2024 PSAUOK elections were male, accounting for 58%. The dismal participation of the female folk may ignite a gender debate among the future PSAUOK actors whether or not it is the dominance of male voters over female voters.

Figure 3: An analysis of Current Roles of Voters in PSAUOK
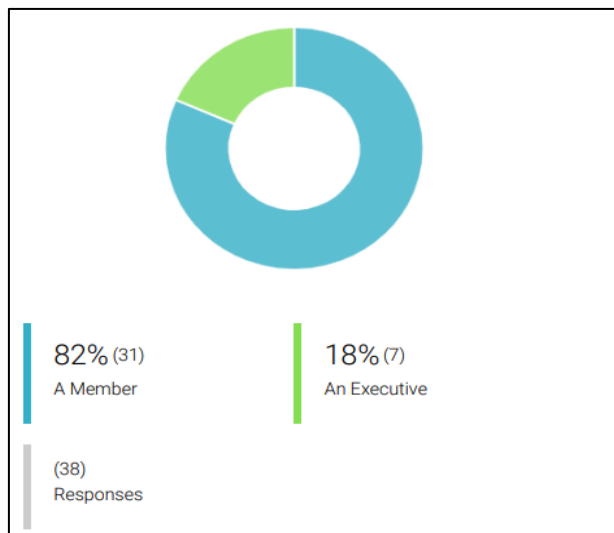

In this findings, in Figure 3, majority of voters (82%) were drawn from regular members. On the basis of the sampling techniques used both purposive and simple random, it would be easily construed that the 18% would comprise a crosscut of Executives and others. This indicates a substantial proportion of the general PSAUOK membership participated in the study. The broad and specific analysis in disaggregates the data in micro specifications for clarity. The captured data are displayed in Figure 4.

**Figure 4: PSAUOK Elections Participants in March 2024**
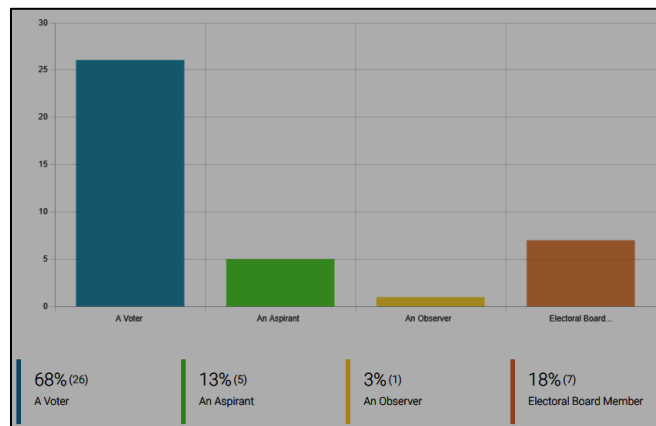
The results presented by Figure 4 displays the different categories of voters in the March 2024 PSAUOK elections. Specifically, 68% represented purely the voters, 13% were aspirants, the 3% were election observers, and 18% were electoral board members. These findings infer that PSAUOK has attempted to implement measures such as; operational systems and institutions in its running and pursuing the involvement of various election stakeholders to promote transparency and accountability in its electoral processes.

Field data of previous Voting history of the voters
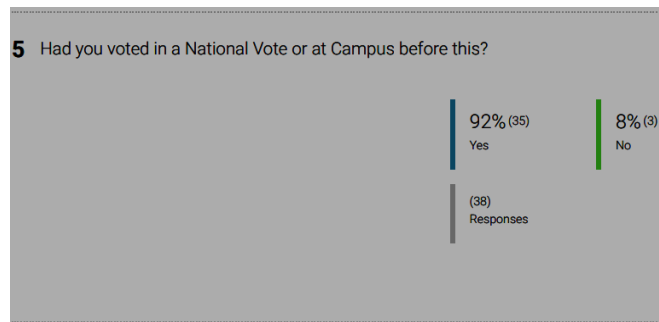
According to field data, it has been observed that 92% of respondents participating in this study have previously voted in National elections or at campus, whereas only 8% have no prior voting experience. Whereas many have voted before, the PSAUOK experience is a milestone process of enabling a learning process for electoral participation which will be useful to the near future for student actors in Kenya and beyond.

Rating the PSAUOK electoral process by those who had voting experience
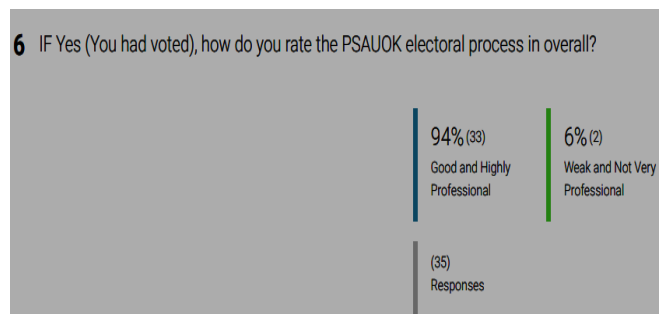

Further, the field data established that a majority of PSAUOK students (94%) rated the electoral process as highly professional and effective. Only a small percentage (6%) expressed dissatisfaction with the process, citing concerns about its professionalism. In essence, the findings indicate that the

professional association PSAUOK upholds higher ideals within her electoral processes giving a reflection of other well conducted elections.

Phone-Based Digital System (PBDS)

The study investigated the potential benefits of implementing a Phone Based Digital System (PBDS) for professional associations like PSAUOK. The student responses on whether Phone Based Digital System (PBDS) can enhance good outcomes for professional associations such as PSAUOK are contained in the findings presented in the Figure 5.

Figure 5: Can PBDS Enhance Good Outcome for Professional Associations like PSAUOK
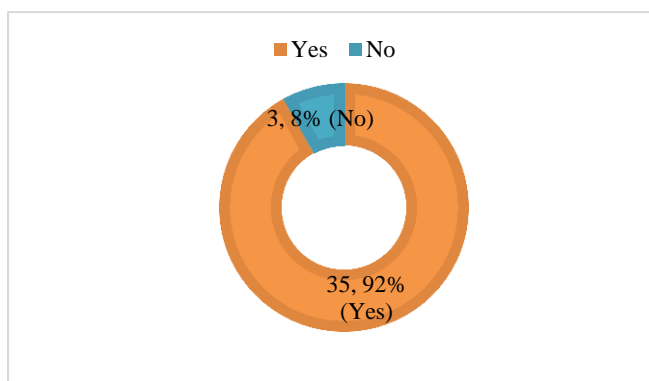
The results depicted in Figure 5 clearly show that a vast majority of student voters, approximately 92%, recognize the importance of using a phone-based digital system to achieve positive electoral outcomes for professional organizations, such as PSAUOK. These findings indicate that student voters recognize and value the effectiveness of mobile technology in modern voting practices. The study's findings echoed a study by Suleiman, Gambo, and Izah (2021)[38] that the proliferation of information and communication technology (ICT) has made it unavoidable for election processes to be dependent on technology.

Conversely, a mere 8% of the students expressed disagreement that phone-based digital systems contribute to the improvement of professional associations. Reasons suggested by those who think differently on PBDS on Electoral outcomes are a package of suggestions in terms of areas for improvement which include:

i) The electoral board should provide civic education to its members so that they can be able to elect effective leaders for the benefit of the association.
ii) To keep in touch with professionalism ideas given by the association, physical election should be held and enhance good leadership promotion.
iii) In many occasions like in the school elections, many students vote even without their consent.
iv) The system should be managed by professional experts to avoid fraud.
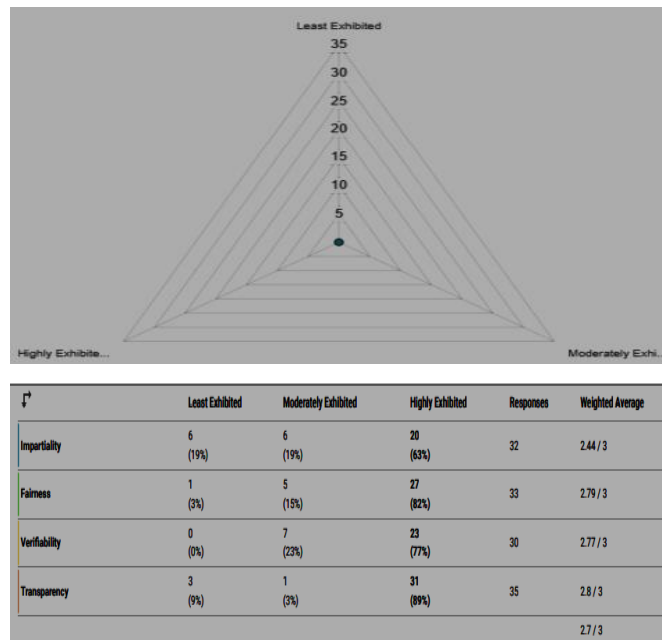v) Accountability and more transparency.

These results align with Njoku et al, (2018)[39] in suggesting that the widespread use of information and communication technology (ICT) might threaten democracy. This is because fully automated voting systems may lack reliability.

[38] Ibid
[39] Ibid

Further, in this study, on evaluation of PSAUOK electoral outcomes under standard elections' attributes as presented in Figure 6. There is a concurrence that the elections conducted had an inclination towards the good attributes of good elections; impartiality, fairness, verifiability, and transparency as shown in the table/figure below.

Figure 6: Evaluation of PSAUOK Electoral Outcome Attributes

	Least Exhibited	Moderately Exhibited	Highly Exhibited	Responses	Weighted Average
Impartiality	6 (19%)	6 (19%)	20 (63%)	32	2.44/3
Fairness	1 (3%)	5 (15%)	27 (82%)	33	2.79/3
Verifiability	0 (0%)	7 (23%)	23 (77%)	30	2.77/3
Transparency	3 (9%)	1 (3%)	31 (89%)	35	2.8/3
					2.7/3

The results depicted in Figure 6 show that impartiality played a major role in determining the electoral outcomes of PSAUOK, with an impressive rating of 63%. Moreover, an overwhelming 82% of students considered the PSAUOK electoral process to be fair. This sentiment was echoed in the fact that 77% of respondents found the process to be verifiable, while 89% attributed transparency to it.

These results validate that the PSAUOK election process demonstrates the four fundamental principles of democracy in election practice: impartiality, fairness, verifiability, and transparency. The study identifies four key principles for PSAUOK elections that align with the guidelines set by the IEBC (2016)[40]. These principles focus on the management of election results and include transparency, verifiability, accuracy, ballot confidentiality, consistency, integrity, and timeliness. The aim is to ensure that stakeholders have access to reliable information, that rules are applied equally, and that the election process is efficient.

Voter Awareness and Civic Education by the Electoral Board

The study assessed the voter awareness and civil education by the electoral board. The obtained results are presented in Figure 7.

Figure 7: Voter Awareness and Civic Education by the Electoral Board

[40] Ibid
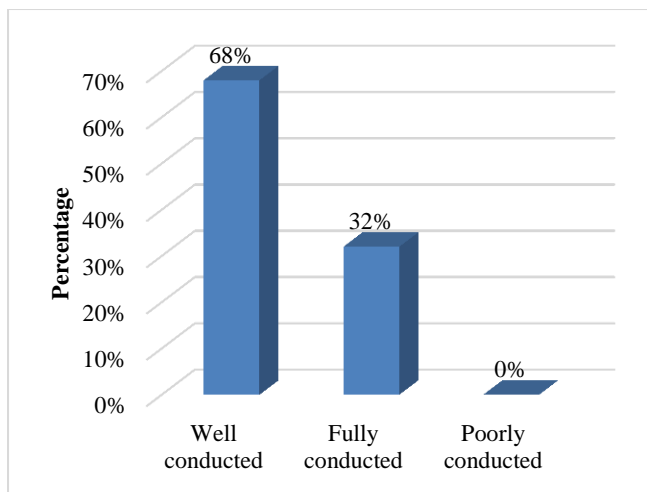
Findings in Figure 7 show that most of the students reported that they have received adequate training and education about voter awareness and civil education from the electoral board, as established by PSAUOK. The voter awareness and civic education on PSAUOK election was well conducted according to 68% of the respondents, while 32% rated it as fully conducted. No participant rated it poorly.

These findings are supported by Mattice (2019)[41] highlights the need for professional education programs for election administrators in the US, emphasizing understanding administrative responsibilities and adult education approaches. To cultivate a more professional cohort, educational and networking opportunities are crucial. The Philippines, known as 'the world's text messaging capital, has significantly utilized text messaging for voter education.

Further, KNCHR (2022)[42] emphasizes the need for effective voter education to encourage meaningful participation through targeted voter registration drives in Kenya. In addition, Pinckney, Butcher, and Braithwaite (2022)[43] emphasize the importance of civil society organizations in facilitating successful transitions to democracy, citing their strong mobilization systems and accountability for emerging leaders, which increases the likelihood of progress.

The study investigated whether students were pleased with the candidate response to vie and voter turnout at the university elections. The obtained results are depicted in Figure 8.

Figure 8: Candidate Response to Vie and Voter Turnout
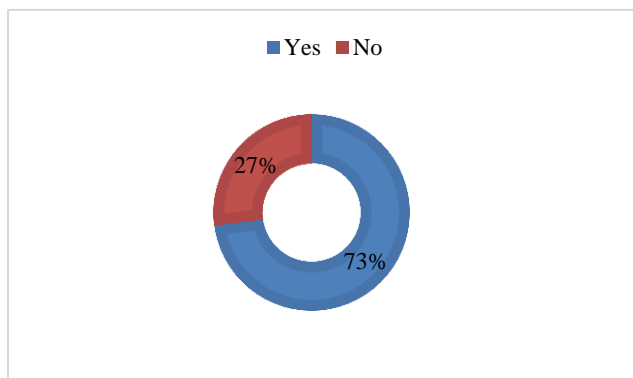
The findings depicted in Figure 8 indicate that a significant majority of students' express satisfaction with the candidate's responses and voter turnout, as evidenced by a percentage of 73%. The results indicate that most students are impressed by the candidate responses and recognize the importance of voting and selecting candidates for elective positions of PSAUOK at University of Kabianga. In addition, the results infer that students' perception of candidate response and voter turnout plays a significant role in shaping their views on the electoral process.

On general, there are 27% of students who are not content with the candidate's responses and voter turnout. These dissenting students suggested the following areas for improvements to Voter turnout:

i) The electoral board should provide civic education to PSAUOK members effectively.
ii) Make earlier sensitization towards PSAUOK elections.
iii) Voter turnout is wanting.
iv) iv) Members' interest in executive roles promotes competitiveness.
v) Encourage and teach the PSAUOK members on the importance of voting to ensure everyone votes.

PSAUOK Electoral Process Outcomes and Voters' Expectation(s)

The study evaluated whether PSAUOK Electoral Process Outcomes met Voters' Expectation(s) on a scaled ranking. The obtained data was illustrated in Figure 9.

Figure 9: PSAUOK Electoral Process Outcomes and Voters' Expectation (s)

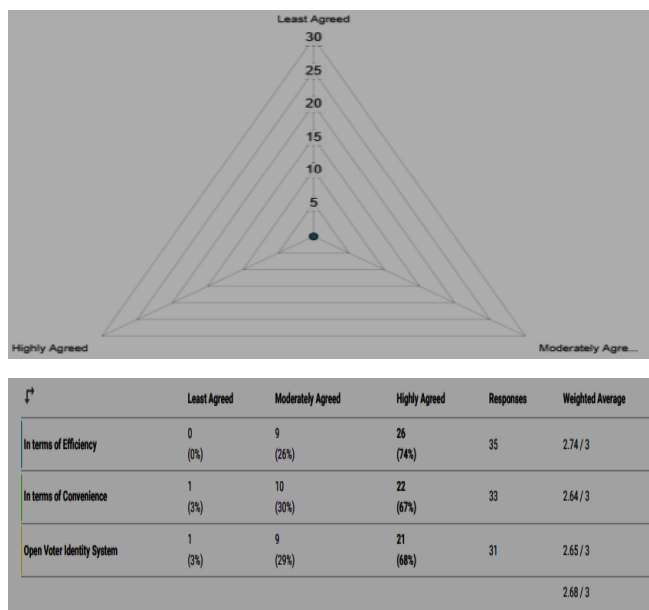|	Least Satisfactory	Moderately Satisfactory	Highly Satisfactory	Responses	Weighted Average
Peaceful Campaign Management	1 (3%)	4 (12%)	29 (85%)	34	2.82 / 3
Electoral Board Communications	0 (0%)	12 (35%)	22 (65%)	34	2.65 / 3
Actual Result Declaration	1 (3%)	2 (6%)	32 (91%)	35	2.89 / 3
					2.79 / 3

The results in Figure 9 portray that 85% of students have indicated that the PSAUOK electoral process meets the standard for peaceful campaign management, which is highly satisfactory. Additionally, 65% of students have reported being highly satisfied with the electoral board's communication throughout the process. Finally, majority of 91% of students rated the actual result declaration highly satisfactory. These findings imply that the PSAUOK electoral process meets voters' expectations, particularly regarding peaceful campaign management, electoral board communication, and actual result declaration.

The Application of Phone Based Digital System in Electoral Process of PSAUOK

---

[41] Mattice (2019)
[42] Ibid
[43] Ibid

The study asked students to rate the application of the Phone-Based Digital System (PBDS) in PSAUOK's electoral process in terms of efficiency, convenience, and an open voter identity system during the university students' elections. The obtained information was analyzed and displayed in Figure 10.

Figure 10: The Application of PBDS in Electoral Process of PSAUOK

↓	Least Agreed	Moderately Agreed	Highly Agreed	Responses	Weighted Average
In terms of Efficiency	0 (0%)	9 (26%)	26 (74%)	35	2.74 / 3
In terms of Convenience	1 (3%)	10 (30%)	22 (67%)	33	2.64 / 3
Open Voter Identity System	1 (3%)	9 (29%)	21 (68%)	31	2.65 / 3
					2.68 / 3

The results illustrated in Figure 10 indicate that a significant proportion of PSAUOK voters/members; namely 74%, strongly favored the efficient deployment of the Phone Based Digital System (PBDS) during the elections conducted at PSAUOK. Moreover, majority of the students opined that the application of PBDS had led to greater convenience in the electoral process. Additionally, around 68% of the respondents preferred the application of PBDS, as it facilitated an open voter identity system in the association elections.

The study's findings mirrored a study by Omwoha (2022)[44] that the utilization of digital technology in electoral processes is intended to increase administrative efficacy, reduce long-term costs, and foster transparency. Citizenship and general election reforms constitute the overarching objective.

Conclusion

The study concludes that voting using mobile phones is a relatively new field of research; past studies primarily looked at specific instances that occurred in a few countries. Further, the study concludes that electoral management is a sensitive task aimed at enhancing governance and ensuring good outcomes. Equally, student elections necessitate a high level of result management to promote democratic ideals in college micro-political environments, necessitating professionalism in ensuring satisfactory voter outcomes.

The study analyzed the outcomes of the last three elections of PSAUOK and found that the management of the electoral results system using PBDS had a favourable impact on professional organizations like PSAUOK. The study established a positive correlation between phone-based digital systems (PBDS) and student election outcomes at University of Kabianga.

---

[44] Ibid

References

1. Baguma, R., & Eilu, E. (2014). Using mobile phones in elections in developing countries: Opportunities and challenges. *Computing in Research and Development in Africa: Benefits, trends, challenges and solutions*, 251-265.

2. Cobos-Flores, F. and McDermott, R. (2015). Electoral Results Management Systems: Catalogue of Options. United Nations Development Programme. https://www.ec-undp-electoralassistance.org/wpcontent/uploads/2018/08/undp-contents-publications-electoral-results-management-systems-catalogue-of-optionsEnglish.pdf

3. Mattice, T. (2019). The Role of Professional Associations in Supporting Election Administration. *The Future of Election Administration: Cases and Conversations*, 149-156.

4. Mauk, M. (2022). Electoral integrity matters: how electoral process conditions the relationship between political losing and political trust. *Qual/Quant* **56**, 1709–1728 https://doi.org/10.1007/s11135-020-01050-1/

5. Mosero, L. (2022). Technology and data protection must coexist in Kenya's 2022 elections.

6. Njoku, O. D., Amaefule, I. A., Nwandu, C. I. & Jibiri, E. J. (2018). Application of ICT and Electronic Technology in Election Management: Challenges in Rural Areas in South Eastern Nigeria. *International Journal of Advanced Engineering, Management and Science (IJAEMS). Vol-4, Issue-5*, Pp. 360 – 365.

7. Olaniyan, O. M., Mapayi, T., & Adejumo, S. A. (2011). A proposed multiple scan biometric-based system for electronic voting. *African Journal of Computing and ICT (Journal of IEEE Nigeria Computer Section)*, *4*(2), 9-16.

8. Pinckney, J., Butcher, C., & Braithwaite, J. M. (2022). Organizations, resistance, and democracy: How civil society organizations impact democratization. *International Studies Quarterly*, *66*(1), sqab094.

9. Stein, M. (2006). Using mobile phones in electoral and voter registration campaigns.

10. Suleiman, A. S., Gambo, A. A., & Izah, M. (2021). The Role of Technology in Election Management with Examples from Five Democracies. *IEEE-SEM*, *9*(8), 173-184.

11. IEBC. (2016). Election Results Management Framework. DRAFT. September 26, 2016.Kenya.

12. Zaghloul, E., Li, T., & Ren, J. (2021). d-BAME: distributed blockchain-based anonymous mobile electronic voting. *IEEE Internet of Things Journal*, *8*(22), 16585-16597.

13. Omwoha, J. (2022). 'Open the Servers': The Implications of Electoral Technology for Kenya's Democratisation Process. *Africa Development / Afrique et Développement*, *47*(2), 147–160. https://www.jstor.org/stable/48682669

14. Shahriar, Rahman, Khan., Md., Rezwan-A-Rownok., Sharmila, Rahman, Prithula., Fahmida, Yasmin, Rifat., Noor, Nafiz, Islam., Muhammad, Nazrul, Islam. (2020). mVote: A Mobile Voting System to Conduct Election during COVID-19 Pandemic. 247-250. doi: 10.1109/WIECON-ECE52138.2020.9398024

15. Selvarani, X. I., Shruthi, M., Geethanjali, R., Syamala, R., & Pavithra, S. (2017, February). Secure voting system through sms and using smart phone application. In *2017 International Conference on Algorithms, Methodology, Models and Applications in Emerging Technologies (ICAMMAET)* (pp. 1-3). IEEE.

16. Larin, I. G. (2020). «Mobile Voter»–Actual Form of Realization of the Electoral Rights by Citizens. *Legal Bulletin of Samara University,6*(2), 127-131.

17. Ullah, M., Umar, A. I., & ul Amin, N. (2013). An efficient and secure mobile phone voting system. In *Eighth International Conference on Digital Information Management (ICDIM 2013)* (pp. 332-336). IEEE.